Index for Volume XXVI, 1929

(Note: Name of month accompanying page denotes advertising section.)

Absorption, The Problem of. By W. H. Harford ... Apr. 29
Accidents—See Safety.
Acetylene. See When Night Work is Advantageous ... 250
Adventurer, tuna fishing boat ... 66
Air Service in Hawaii, An. By Andrew Farrell ... 416
Airport, New Pivoted (Kearfott) ... 295
Alabama's State Terminal (Mobile) ... 146
Albina Marine Iron Works—See Workboat Notes ... 28, 154
Aldanese, V.: Cargo Handling Facilities at Philippine Ports ... 144
Alexander, H. F. ... Jan. 33
Aleutian Native Leaves on Maiden Voyage, M. S. ... 424
Allen-Burmeister & Wain generating set (Asama Maru) ... 492
Alloys on Shipboard, Nonferrous ... 379
American Bridge Company ... 198
American Chain Co., Inc.—Trade Literature ... Aug. 27
American Engineering Co. ... 24, 347, 282
American-Hawaiian Steamship Co. ... 35, 225, 248, 310
American-La France and Foamite Corp. ... 449, 492
Alfite Portable Fire Extinguishers ... 337
American Marine Standards Committee ... 133, 384
American Merchant Fleet, Its employment, location, etc. ... 99
American Merchant Lines—Shipping Board Sells U. S. Lines ... 93
American Paint Company ... 356
American Salt Company ... 68
American South African Line, Inc. ... 282, 334
American Steel & Wire Company ... Apr. 29
Anderson & Cristofani ... 154, 330, 377, Dec. 33
Anne Hanify, schooner ... Aug. 27
Annie W., tug ... 199
Aorangi, motorship ... 149
Arcola heating system (See Skansonia) ... Nov. 37
Armes, George ... Mar. 17
Armitage, Arthur H. ... 416
Asama Maru, motorship ... 61, 360, Dec. 15, 489, 492
Asbestolith ... Mar. Insert A, 248
Associated Boat Industries of Northern California ... 240
Associated Oil Company ... 134, 492
Association of Pacific & Far East Ports Holds Sixteenth Meeting in Tacoma and Olympia. By Chas. F. A. Mann ... 320
Papers Read at ... 364
Astoria Marine Supply Co. ... 124
Atlantic, Gulf & Pacific Co. ... 470
Atlas-Imperial Engine Company ... 35, 66, 120, 155, 187, 199
May 27, 240, 328, 329, 330, 377, Sept. 29, 461, Dec. 33
Aviation in the United States, Commercial ... 16

Babcock & Wilcox Company—10, 58, 72, 104, 268, 287, 325, 356, 450, 459
... 485, 502
Ballard Marine Railway Company ... 288
Baltimore Association of Commerce—Trade Literature ... 109
Barnet Philips Company—See Virginia, Pennsylvania ... 5, 444
Barnhill, O. H.: Tuna Boat Hermosa Makes a Record ... 157
Centrifuging Diesel Fuel Oil ... 196
Battlog Co., Inc.—See Sal Log.
Bauer, Dr. Gustav ... 472
Bauer-Wach steam propulsion system ... 118, 472
Bearings, Better Marine (Intl. Metal Sales Co.) ... 293
Beekman, R. A.: Modern Ship Propulsion ... 5
Behring, The Bark. By F. C. Mathhews ... 276
Bell, Captain W. E. ... Jan. 39
Belle of Oregon (sailing ship), A Short History of Besse's Famous Bark. By F. C. Matthews ... 224
Bellingham, Rapid Growth of. By C. F. A. Mann ... 333
Marine Railways—See Workboat Notes ... 328
Berg, Eskil ... May 15, Dec. 23
Bernhard's Inc.—See Humuula ... 356
Berrian, H. C.: Turbo-Electric Drive for Merchant Ships ... 314
Berwind White Coal Mining Company ... 325
Bessemer Gas Engine Company—See Cooper-Bessemer Corp.
Bethlehem Shipbuilding Corporation, Ltd. ... 30, 58, 113, 169, 215,
... 236, 268, July 21, 325, 347, 356, Oct. 13, 494, 502
Bethlehem Steel Company—Columbia River Bridge ... 499
Bitumastic—See Humuula ... 356
Black & Decker Mfg. Co.—Trade Note ... June 27
Blue Moon, cruiser ... 463
Blunts Reef, New Diesel-Electric Lightship for ... 516
Boeing Air Transport Co., Inc. ... June 25
Boiler, Care of Donkey ... 327
Bolt in a Slot, How to Hold a ... 65
Book Reviews ... 3, Jan. 47, 162, 207, 208, 339, 428, 477, 510
Bowers, William W. ... Aug. 21
Brass, Parson's White ... 389
Bremen, steamship ... 360, 466, 507
Bridge, San Mateo-Hayward (cut and caption) ... Apr. 29
Longview-St. Helens, across Columbia River ... 499
Brinkhoffer, Harold ... Mar. 19
Bristol electric pyrometer—See Coronado ... 187
Britannic, motorship ... 361
British Coasting Vessels ... 109
—Harbor Tugs. By R. C. W. Courtney ... 330
—Liner Construction. By R. C. W. Courtney ... 420
Brodinger, A. ... Dec. 19
Brown-Boveri turbo-blowers—See Asama Maru ... 492
Brown Instrument Company ... 14, 163
Brunswick-Kroeschell Company ... 30, 72, 153, 232, 282, 449, 485
Brunton, Julius (See also Willard batteries) ... 241
Bryant, Frank G.—Agent for Winton Engine Co., which see
Buda-M.A.N. Diesel Engine, Latest Development in ... 73, 116
Buddhist Beyond, Into the. By Andrew Farrell ... 267
Buffalo Forge Co. ... 485
Buffalo Gasoline Motor Co. ... 69
Burmeister & Wain, Ltd.—Trade Literature ... 384
Burrard Dry Dock Company ... 192
Busch-Sulzer Bros.-Diesel Engine Co. ... 194, 244, 252, 295, Aug. 27
Byron-Jackson Pump Company ... 187, 376, 377, Sept. 29, Dec. 33

Calculating Graph, A Convenient. By W. F. Schaphorst ... 460
California—A California School Ship ... 177, 265, 278, 355
—Perishables—See Seagoing Pomological Laboratory ... 281
—Deepsea Fisheries ... 332
California, steamship ... Aug. 13
California Standard, tanker ... 234, June 17
Campbell Machine Works ... 24, 67, 68, 110, 242, 376, 461
Candy, Captain H. A. T. ... Feb. 15, 446
Canton, China. See port development plans of Yuchu ... May 25
Cameron Diesel Engineering Works—See Vancouver Built Diesel ... 29
Canadian Neighbors, Our ... 148, 192, 243
Canadian Pacific Railway ... 192, 243
Cannon Mills—See Hualalai ... 268
Cardena, steamer ... 149
Carrissima, cruiser ... 377
Carlson, Captain Nils ... Mar. 14
Carnegie Steel Company ... 198
Carroll, Philip H.: Comparison between Leases, Preferential Assignments, and Direct Operation of Port Terminal Properties ... 364
Carstairs, Chief Engineer John ... Feb. 19, 446
Casey, James A.: On a Windjammer in the Late Eighties ... 180
Centrifuging Diesel Fuel Oil. By O. H. Barnhill ... 196
Ceres, ship—Hearts of Oak ... 367
Chapman, Paul W ... May 17
Cherie, cruiser ... 463
Chicago Tower—A New Type of Port Terminal ... 75
Chichibu Maru, motorship ... May 21
Chief Takes Over, The New. By A. G. Elliott ... 284
Chillman Shipyard and Engine Works ... 329
Chilore, steamer—See Some Coal Records at Cristobal ... 421
Chinese Junks, wood block, frontispiece ... Jan. 29
Christie Marine Motor ... 426
City of Sydney, barkentine ... 125
City of Honolulu receives Naval Reserve flag ... Feb. 17
City of Victoria, ferryboat ... 244
Clark, Robert W.: Electrified Auxiliary Machinery of New South African Line Motorship ... 334
Cleveland steam cooker—See Hualalai ... 268
Cliff engine—See With the Northwest Boat Builders ... 329
Coal Records at Cristobal, Some ... 421
Coast Line Shipbuilding Company ... 237, 332, 404
Coen Company, New Sales Manager for—J. T. Voorheis ... 340
Coes, H. V.: Fundamental Principles in Materials Handling ... 140
Cold Storage, Waterfront. By J. R. West ... 408
Coleman, H. C.: Westinghouse Marine Developments in 1928 ... 34
Collar Valve Corporation—A Leakless Globe Valve ... 294
Compressors, Worthington Timken-Equipped ... 337
Condenser Tubes, Influences which Shorten the Life of ... 107
Improvements to a ... 296
Maintenance and Operation of Marine ... 324
Improving Efficiency with the Surface Condenser. By Lt. C. A. Griffiths, U. S. N. ... 504
Constitution, U. S. frigate ... 379, Dec. 29
Continental Gas Engine—See ferry Coronado ... 187
Conversion graph for use of ship operators ... 281
Coolidge (L. H.) Propeller Co. ... 328, 424, 427
Cooper-Bessemer Corporation ... Feb. 25, 155, 206, 251, 384, 470
Copeland refrigerator ... 424
Copper and Brass Research Association ... 379
Cordes Brothers ... 187, 336
Cormorant Converted, Trawler ... 112
Coronado & San Diego Ferry Co. ... 172, 187
Correspondence—Fuel and Safety—from Robert Andrews ... 153
Cory & Son, Inc. Chas.—San Francisco Branch Expands ... 472
See also ... 14, 72, 187, 232, 236, 268, 356, 402, 424
Courtney, R. C. W.: British Harbor Tugs ... 330
British Liner Construction ... 420
The Bremen Design ... 507
Cox, Nostrand & Gunnison—See Virginia, Pennsylvania ... 5, 445
Cox & Stevens ... Aug. 29, 423
Coyle, H. E.—Marine Superintendent Mackay Radio ... 81
Coyle Battery Co. ... 149
Crain, James Howard ... Oct. 19
Cramp Brass and Iron Foundries—Parsons White Brass ... 389
Crane Packing Company ... 107, 296
Cristobal, Some Coal Records at ... 421
Cronin, "Artie" ... Nov. 25
Cronquist, William ... July 19
Cruiser Design, An Interesting (by S. Padgett Hodson) ... 111
A Comfortable 65-Foot Seagoing (for E. F. Merry) ... 286
Cullen, Captain Gregory ... Mar. 19
Cummins diesel engine ... 331, 516
Cunningham, Allan ... 108, 164, 187, 232, 236, 268, 288, 356, 402
... 424, Oct. 29, 502
Cunningham, Ralston R. ... 76
Curtis, Henry Griffin ... Sept. 15
Curtis, Captain Lebius ... Nov. 29
Cutler-Hammer, Inc. ... 119, Mar. 21, Apr. 21, 424

Dannedaike, tanker ... 223
Dardelet Threadlock Corp.—Trade literature ... Apr. 25
Davidson, Albert—New Shipping Firm ... Aug. 27
Davis Engineering Company—Paracoil Equipment on S. S. Pennsylvania ... 469
See also ... 31, 268, 356, 449, 485
Defiance, diesel ferryboat ... 328
Defiance, motorship—See Triumph and Defiance ... 200
Delftdyk, motorship ... Dec. 27
De Laval Separator Company ... 199, 235, 236, 268, 288, 356, 402, 492
De Laval Steam Turbine Company ... 373, 472, 104, 376, 401
De La Vergne Machine Co., I. P. Morris 65, 71, 108, 232, 338, 421, 463
Delco Light Company—See cruiser Hoqua ... 113
Delta Standard, tank barge ... 113
Derby Fire Detecting System 72, Mar. A, 268, 356, 449, 492, Dec. 31
Diamond Power Specialty Company ... 58, 268, 330, 356
Dickie, D. W.: Care of Perishable Cargoes ... 368, 418

Dickie, Renwick Z.: Improved Fuel Consumption with Steam .. 161
Diehl Manufacturing Company—See President Johnson...... Mar. A
Diesel Engine Manufacturers Organize Association.......... 380
Diesel engine as auxiliary power for steam propulsion—See A Novel Conversion Idea (Washington Iron Works)...... 120
Dirigold Corporation 242
Dixie, steamship 104
Dohrmann Hotel Supply Co. 268, 356
Dollar, Robert .... 53, July 17
R. Stanley (portrait sketch) 486
Steamship Company ....52, Mar. 11, Mar. Insert A, Nov. 19, 513
Dolphin, cruiser 67
Don Juan, Ex-Rosalia, Ex-?. By F. C. Matthews 367
Dongan Hills, ferryboat 248
Douse, Robert H. .... Mar. 21
Doxford & Sons Wm. 152
Drainator steam trap—See Hualalai 268
Duro pump ....424, Nov. 37
Dwight F. Davis, towboat 287

Eastern standard engine—See Standard Motor Construction Co.
Economizer Test, Marine (Foster) 153
Economics of the All-Electric Ship, Operating. By F. V. Smith 184, 229
Edison Electric Appliance Co. 5, 14, 31, 233, 444, 449, 489
Edison incandescent lamp—See Light's Golden Jubilee.... 191
Edison Storage Battery Co. ....24, 236, 288, 376, Nov. 37
Editorials....49, 93, 133, 177, 221, 265, 309, 353, 358, 413
Electric—Progress in Electrical Propulsion (G. E.) 70
Operating Economies of the All-Electric Ship. By Frank V. Smith 184, 229
Turbo-Electric Drive for Merchant Ships (G.E.) 314
Auxiliary Machinery of New South African Motorship (Westinghouse) 331
Geared versus Electric Drive for Merchant Vessels. By A. Peterson (De Laval) 372
Propulsion for River Towboats (Westinghouse).... 382
Electric Ferries, Inc. .... Apr. 21
Electric Storage Battery Company—See Exide batteries.
Electro-Dynamic Co. ....112, Apr. 21, 232
Eleu, tugboat 215, 236
Elliott, A. G.: The New Chief Takes Over 281
Ellis Channel System of Hull Construction 159, 252
Elwell-Parker Electric Co. 75, 383
Emma R. S., fishing boat 199
Empress of Britain, steamship 508
Engine Room, New Regulations for Motorship (at Hamburg). 458
Engine Room Efficiency through Quality Lubrication, Better. By A. L. Harrison 508
Enterprise Engine Company—See photo of John F. Gilmore.... 36
Esquimalt Dry-Dock, Victoria 243
Esty, Col. Thomas B. ....Nov. 27
Ets-Hokin & Galvan 241
Eurana, steamer 464
Europe Steps Out .... Mar. 23
Evanger, steamer, A Breakwater for a Day (frontispiece) Sept. 13
Everett Marine Ways 329
Excelsior Quilting Co. 268
Exide Battery 241

F. A. E. Manufacturing Co. (FABCO-Tuxham engine) 427
Fairbanks, Morse & Co.—Director of Sales, J. A. Manley.... 36
Coast Manager Elected Vice-President, A. W. Thompson 36
Group of officials and wives visit Seattle ....Aug. 15
Auxiliary set for diesel motorships ....Nov. 37
See also .... 66, 154, 155, 156, 157, 193, 236, 244, 328, Nov. 37
Farrell, Andrew: Into the Buddhist Beyond 267
An Air Service in Hawaii 416
"The Biggest Little Ships" 502
Fast flexible coupling—See Hualalai 268
Fathometer 119, 249, 338, 384, 467
Federal Composition and Paint Co. 169
Fellows & Stewart 463
Felspar, steamer 109
Ferdinand & Co., L. W.—See Jeffrey's Marine Glue
Ferris, Theodore E.—See Pulverized Coal Steamers.... 325
Filtration, Cumulative Oil (Nugent filters) ....July 61
Fisheries, California Deepsea 332
Fishing a Big Business 319
Fishing Vessel Owners' Marine Ways 461
Flexitallic Gasket Co. 203
Floridian, steamer 153
Foamite 14, 337, 449, 492
Ford, Edward T. (portrait sketch) 442
Foreign Trade—Pacific Coast Trade Round the World (Dollar).... 52
Our Foreign Customers 53
Foreign Trade Outlook. By Dr. Julius Klein 60
Major Trends in Foreign Trade ....Feb. 25
Foreign Trade for 1929 (Editorial) 133
World's Steel Exports in 1928 .... Apr. 23
The Problem of Absorption. By W. H. Harford....Apr. 29
The Business of the Sea. By James A. Farrell 226
Prospects of United States Foreign Trade. By R. P. Lamont 227
Our Stake in the Pacific (Chester H. Rowell) 267
American Foreign Trade in 1929 (Handbook, National Foreign Trade Council) 323
A New Phase in Chinese Trade 323
Present Conditions in Trade With Latin America....Aug. 23
American Foreign Trade and Shipping. By A. H. Haag.... 353
International Trade in Wool 496
America's Foreign Trade and Its Ships 498
Foshay, W. B. Company 244, 4
Foss Launch & Tugboat Co.—See Marine Notes 241
Foster Engineering Co.—See Foster Valves 470
Foster Wheeler Co. 18, 153, 202
France Packing Company—Trade Literature 41
Frank & McCrary—See Seattle Workboat Notes ....Oct. 29
Freighter in the Orient, An American. By Fred B. Michelson.... 17
Freights, Charters, Sales (Page Bros.), Jan. 41, Feb 27, Mar. 25, Apr. 25, May 29; June 27; July 27; Aug. 25; Sept. 27; 433; Nov. 33; Dec. 27.
Frick refrigerator—See Humuula 358

Frigidaire Company—See C. W. Martin appointment.. 75
See also .... 236, 241, 516, Dec. 25
Fuel—and Safety. By Arthur M. Tode 56
—Consumption with Marine Steam Plants, Improved. By R. Z. Dickie 161
—Consumption, A New Record in Low (s. s. Statendam) . 159
Fuller-Lehigh table mill for pulverized coal 287, 325

Gallagher, Frank .... Aug. 17
Gas Devourer (Rotterdam Dry Dock Co.) 293
Gasoline Through the Canal in 1929, California .... Sept. 27
Geared Versus Electric Drive for Merchant Vessels. By A. Peterson 372
Geary, L. E. 66, 461
General Electric Company—Propulsion Machinery of the Virginia 10
Summary of Activities in 1928. By D. W. Niven 33
Trade Literature 41, 71, 339, 383
Progress in Electrical Propulsion in 1928 70
Operating Economies of the All-Electric Ship. By F. V. Smith 184, 229
Turbo-Electric Drive for Merchant Ships. By H. C. Berrian 314
Pennsylvania's Electrical Power Plant. By Frank V. Smith 449
Modern Ship Propulsion, I. By A. Kennedy Jr., and R. A. Beekman 500
See also 29, 108, 198, 206, 232, 288, 338, 402, 463, 485, 516
General Engineering & Drydock Co. 133, 246, 247
General Machinery Corp. 59
General Marine Works 515
Giesel, Chief Engineer H. .... Sept. 17
Gilmore, John F. 36
Golden Cross, steamship 153
Golf Tournament, Steamship ....May 15, June 21, June 22
Goodall pipe truck—See Parke & Kibele 426
Goodrich Rubber Company, B. F. .... 187, June 27
Goodyear Tire & Rubber Co. .... Mar. Insert A, 206, 238, 268, 4 4
Government Competition, Unfair (Editorial) 93
Grace & Co., W. R. .... June 27, 485
Grandy Boat Co. .... Oct. 29
Granite State, American ship 81
Grays Harbor .... Apr. 25, Sept. 21
Great Admiral, the Famous Ship. By F. C. Matthews.... 1, Apr. 11 137
Gregory, F. C.: Pacific Maritime Safety Code 365
Recent Progress in the Safety of Stevedoring Operations 441
Grey, Miss Bessie .... May 19
Griffith, Captain Maynard .... Aug. 17
Griffiths, C. A.: Improving Efficiency with the Surface Condenser 501
Griscom-Russell Co. .... 252, Aug. 25, 485
Gross, Charles F.: The Influence of Rudder Shape on Steering Ability 157
Gunn, Miss Dorothy .... May 17
Guthrie, Captain Donald .... June 17

Haag, Alfred H.: American Foreign Trade and Shipping 353
Haefner, Leslie J. 385
Haines, A. F.: Terminal Economy and Cargo Management.... 362
Hall, Captain L. J. .... Feb. 21
Hall-Scott Motor Co.—
See Workboat Notes .... 67, 154, 199, 328, Oct 29, 514
Hamano, Chief Engineer T. .... Dec. 19
Hamburg-American Line Motorship Oakland 494
Hamburg—See New Regulations for Motorship Engine Room.. 458
Hand, Robert F.: Safety—The Management's Job 183
Hansen, H. C.—See Workboat Notes 242
Harbor Boat Building Co.—See Workboat Notes 199
Harbors Needed, More Motorboat .... Nov. 37
Harford, W. H.: The Problem of Absorption .... Apr. 29
Harrison, A. L.: Better Engine Room Efficiency Through Quality Lubrication 508
Harrington, Col Edward C.: Why Dwarf the Waterways?.... 318
Haskelite Manufacturing Co. 268
Haviside Company .... Apr. 29, 201, 292, Aug. ?
Hawaii. An Air Service in. By Andrew Farrell 416
Hele-Shaw Pump 247
Henderson, S. D.: Shake-Down Cruise of a Coast Guard Cutter 55
Hermosa Makes a Record, Tuna Boat. By O. H. Barnhill.... 157
Hewison, Captain J. M. .... June 19
Hickman air separator 268, 356
Higgins, H. A. .... Mar. 17
Hill, Chief Engineer John E. .... Apr. 15
Hill diesel engine 286
Hill, Hubbell & Company 268, 356
Hirschy, L. H. .... Oct. 15
Hobart Manufacturing Co. 268
Hodson, C. Padgett 110, 377
Holland American Line .... 459, Dec. 27
Honolulu Harbor Plans 142
Hoqua, cruiser 113
Hough & Egbert 247, 268, 356, 377, 427
How to Hold a Bolt in a Slot 65
How to Bend a Pipe 65
Hualalai, steamer .... 215, July 13, 268, 502
Humuula, steamer 317, 358
Hyde Windlass Co. ....14, 31, 72, 74, 268, 449, 470, 485, 516, Dec. 25
Hydrographic Service, The International. By Rear-Ad. A. P. Niblack 397

Ilg Ventilator Co. 268
Indiana Floor Co.—See President Johnson .... Mar. Insert A
Ingersoll-Rand Co. ....163, 282, 383, Oct 29, 485
Inland Waterways—Why Dwarf the Waterways? By Col. E. C. Harrington 318
The Mississippi River as an Artery of Commerce (Ohio) .. 456
Inland Waterways Corporation—See towboat Dwight F. Davis .. 287
Insulation of Cold Storage Rooms, Efficient (Torfoleum) 381
Inter-Island Steam Navigation Co. 215, 236, 268, 356, 416, 502
International Compositions Co.—Rubshell Texas, Inc. 203
International Mercantile Marine Co.—See Panama Pacific Line.
International Metal Sales Co. 232, 251, 293
International Nickel Co. 109, 295, 331, 356, 384, 470
International Silver Co. 268
Invader, fishing boat 376

Isherwood, Sir Joseph, Bt. 94, 232, 234

January, Captain Gerald T. .... Apr. 17
J. B. Brown, ship 180
Jordan, William .... July 19

Kampen, Captain S. .... Sept. 17
Kanaga Ranching Co. .... 4'
Katherine D. 156
Kearfott Engineering Co. 5, 31, 295, 444, 485
Kelso-Longview, Port of 499
Kelvin & Wilfrid O. White Co. 72
Kelvinator—See yacht Saga 423
Kennedy, Jr., A.: Modern Ship Propulsion 500
Stanley, C.—See An Air Service in Hawaii 416
Kerr Line .... Jan. 41, 95
Key System Transit Co. 336
Kidde & Co., Walter—See Hough & Egbert-Derby-Lux-Rich-Selex-Fyre Freez, Inc.
King Shipyard 461
King-Knight Co.—See Northern pumps—Hill diesel—Nelseco diesel—Sterling diesel
Kingsbury Machine Works 58, 187, 268, 282, 356, 382, 449, 485, 516
Kinks, Cautions, and Suggests. By W. F. Schaphorst 151
Kinney pumps—See Delta Standard 113
Kirby, H. B.—See With the Northwest Boat Builders 328
Klein, Julius: Foreign Trade Outlook 60
Kneass, Co., Geo. W. .... 241, 268, 3'
Knock, Getting at the Bottom of a Nut and a 64
Knots per Hour 179
Knots, Loose 266
Kobenhaben, training ship (Editorial) 358
Kohler Electric Plants in the Marine Industry 162
See also .... 40'
Kokusai Steamship Co.—See Fair Exchange .... Sept. 21
Kolster Radio Compass, Improved 468
See also 14, 492
Konel metal—See Westinghouse Develops New Metal 427
Koster, Frederick L. 53
Krupp Works 234
Kruse & Banks Shipyard 329
Kuner, Max, navigating equipment 424

L. A. City No. 3, fire launch 156
La Brea, tanker .... Nov. 33
Lake Union Dry Dock & Shipyard .... 199, 240, 329, 424, Oct. 29
Lake Washington Shipyards .... 164, 402, Oct. 29
Lalor, J. M. 472
Lamb, Carl J.—See Westinghouse Creates Diesel Department 163
Lambie, William .... Dec. 29
Lane, C. V. .... June 27, 467, 470, 471
Lapham, Roger: Transportation Trends 354
Portrait sketch of 398
La Placentia, tanker .... Feb. 21
Larson, Al .... Sept. 29, Dec. 33
Laurence-Scott winches—See Asama Maru 492
Lee and Brinton 154, 402
Lewis-Shepard Co. 467
Lidgerwood Manufacturing Co. .... 14, 499, Nov. 35
Lietz & Co., A. 187, 236, 268
Lifeboats, High Speed (British) .... 9'
World's Largest Lifeboat (Princess Mary) .... Sept. 29
Lighthouse Conference, International 413
Lightship for Blunts Reef, New Diesel-Electric 516
Linatol Flooring—Hill, Hubbell & Co. 236, 268, 356
Lincoln Electric Co. 116, 163, 335, 338
Linde Air Products Co. .... Apr. 25
Link-Belt roller chain 156
Lipman refrigerator .... Sept. 29, Dec. 33
Lloyd's Register of Shipping—Report for 1927-1928 25
Longview-Kelso, port of 499
Los Angeles Harbor .... Jan. 43, 158
—Manufacturing Co. 331
—Shipbuilding & Drydock Co. 304
—Steamship Co. 120
Lotusland, yacht .... Aug. 29
Lubrication, Better Engine Room Efficiency Through Quality. By A. L. Harrison 508
Lundin lifeboats—See Hualalai 268
Lunkenheimer King-Clip Gate Valve 290
Lux Fire Extinguishing System 113, 356

MacLafferty, James H.: Shall the American Coastwise Laws Be Extended to the Philippines? 101
McCarthy, A. J. .... Feb. 15
McCormick Steamship Co. .... 16, Feb. 27, Mar. 27
McIntosh & Seymour Corp.—See Triumph and Defiance 200
McKenzie, Hugh .... Feb. 17
McMicken, E. Grant .... Dec. 21

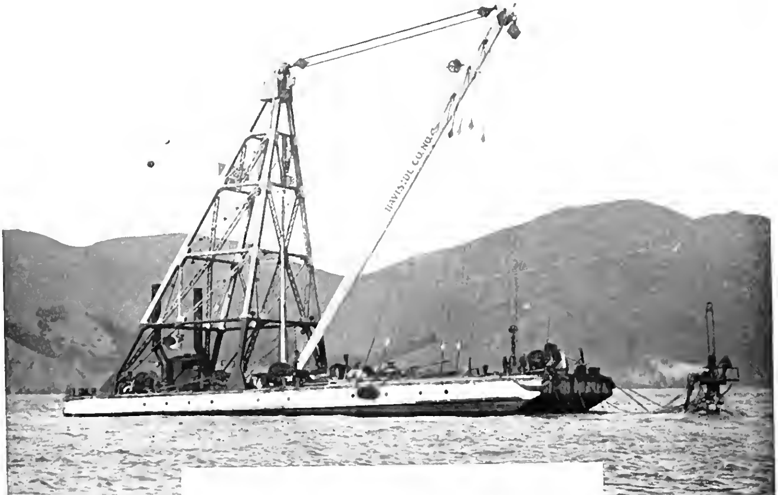
Mabry, Curtis D. .... Dec. 29
Mackay Radio & Telegraph Co.—H. E. Coyle 81
Madison-Kipp lubricators 187
Maggard, Edward H. .... Dec. 21
Magic Coal—See President Adams 238
Mail Contracts—Direct Mail to South America .... Feb. 27
Maillard & Schmiedell—Torfoleum 381
Malolo, steamer .... June 13, 457
Manila .... 17, 1''
Manley, J. A. 36
Mann, Chas. F. A. .... Oct. 21
Port of Olympia Shows Remarkable Growth 245
Rapid Growth at the Port of Bellingham 333
Portland Gets Deep Channel to Sea 359
Marine Equipment and Insurance Rates (Editorial) 311
Marine Service Bureau—Employment Bureau Vindicated 133
See also Safety
Marine Insurance 37, 77, 121, 165, 209, 253, 297, 311, 341, 385, 429, 473
Mariner, fishing boat 65, 110
Markey Machinery Co. 240
Marsten, Weaver L. 163
Marten & Co., A. F. .... Mar. Insert A, 238
Martin, C. W. (Frigidaire) 75

Martinac & Co., J. M. .... 2[illegible]
Mary W., cannery tender and patrol .... [illegible]77
Materials Handling—
An American Freighter in the Orient. By Fred B. Michelson 17
Fundamental Principles in. By Harold V. Coes .... 14[illegible]
Cargo Handling Facilities at Philippines Ports. By V. Aldanese 144
Terminal Economy and Cargo Management. By A. F. Haines 363
Largest Contract Awarded for (Westinghouse) 511
Matson Navigation Co. .... July 29, Aug. 23, 363, Nov. 19, 457, 494
Matthews, F. C.: The Famous Ship Great Admiral .... 1, Apr. 11, 137
The Belle of Oregon 224
The Bark Behring 276
Famous Stars of the Pacific, III. Star of Iceland (ex-Willscott) 312
The Don Juan, Ex-Rosalia, Ex-? 367
Mechanics for Marine Engineers. By A. L. Becker 62, 106, 150, 194
Melville, fishing boat 155
Memory, cruiser .... July 27
Merrick, F. A., Elected Westinghouse President 340
Merritt, Chapman & Scott Corp. .... 250, Sept. 13, 337
Metropolitan Life Insurance Co. 471
Michelson, Fred B.: An American Freighter in the Orient 17
Mikimiki, tug 288
Miller, Samuel Wylie (Obituary) .... Mar. 21
Mississippi River as an Artery of Commerce 456
Mitsubishi Company 489, 492
Miyamoto, Chief Engineer R. .... Jan. 37
Mobile 146, 203
Mojean & Ericson 155, 242, 461
Monadnock Mills 268
Monel metal—See International Nickel Co.
Moore Dry Dock Co., The 153, 187
Moran Manufacturing Co. 424
Moreno, Joseph .... Apr. 19
Morris-De La Vergne, Inc., I. P. (Cramp-Industrials, Inc.) 338
Morse & Son, Inc., Andrew J. 404
Motorboat Show, San Francisco 1929 .... 240, 241, 242
Motorboats for U. S. Army Engineers, Arc-Welded Steel 335
Motorship Engine Room, New Regulations for (Hamburg) 458
Mott Company of Pennsylvania 485
Muntz metal tubes 268

Naco anchor chain .... 516, Dec. 27
Nashville Bridge Co. 156, 422
National Battery Co.—See Chas. Cory & Son, Inc. 472
National Council of American Shipbuilders 49, 179
National Electric Products Corp. 65
National Flue Cleaner Co. 36
National Foreign Trade Council 178, 226, 227
National Industrial Conference Board, Inc. 309
National Lead Storage Battery—See Aleutian Native 424
National Liquid Meters—See Asama Maru .... 492, Dec. 31
National Malleable & Steel Castings Co.—See Santa Clara 485
National Petroleum News .... Sept. 27
National Safety Council, paper read at—See Safety
Naval Architects and Marine Engineers, Society of 94
Navigator, fishing boat 376, 461
New Jersey Paint Works—See The Navigator's and Mariner's Guide .... Feb. 27
New London Ship & Engine Co.—See Nelseco engine.
New York-New Jersey Business Associates, Inc. 96
New York Port Problems. By Norman F. Titus 96
New York Shipbuilding Co. 252, 485
Newall, Martin—See booth at Motorboat Show 240
Newhall Chain Forge & Iron Co.—See Trade Notes 340
Newport News Shipbuilding & Drydock Co.
Turbo-Electric Drive for Merchant Ships. By H. C. Berrian 314
Dry-Docking Loaded Vessels at 461
See also .... Mar. A, 444, 449, 513
Niblack, Rear Admiral A. P.: The International Hydrographic Service 397
Nicaragua Canal Survey 266
Nichols, Captain Daniel C. 106
Nippon Yusen Kaisha—See Asama Maru .... 61, Dec. 15, 489, 492
Nishga, fishing boat 155
Niven, D. W.: Summary of General Electric Marine Activities during 1928 33
Noos Head, steamship 109
Norab, yacht 24, 67
Northeast Electric Company 404
Northern Pump Co.—See Tidewater 232
Northland Transportation Co.—See W. B. Foshay 164, 409
Norton, Lilly & Co.—First Aid Station 407
Norwegian Merchant Service .... Mar. 2[illegible]
Novo gasoline engine—See Delta Standard 113
Nugent & Co., W. W.—See Cumulative Oil Filtration .... July 61
Nunes Brothers 288

Oakland, motorship 495
Oakum? What is 248
Oceanic and Oriental Steamship Co. 153
Oceanic Steamship Company—New Passenger Liners for 494
Ohio river development—The Mississippi River as an Artery of Commerce 456
Oil—Cumulative Oil Filtration .... July 61
Centrifuging Diesel Fuel Oil. By O. H. Barnhill 196
Olympia, U. S. S. 471
Olympia Shows Remarkable Growth. By C. F. A. Mann 245
Orient, An American Freighter in the. By F. B. Michelson 17
Orlando, Pasquinucci 199
Overholser, Prof. F. L.—See Seagoing Pomological Laboratory 281
Oxweld Acetylene Company .... 115, 2[illegible]8, 250, 512

Paasche Air Brush 427
Pacific American Steamship Association 50, 133, 412
Pacific Coast Pleasure Boat Show 240, 241, 242
Pacific Foreign Trade Council .... Sept. 25
Pacific Ice Machine Co., agents for Brunswick-Kroeschell, which see
Pacific Marine Supply Co.—See Trade Note .... June 27



American Wire Rope Holds Against Year's Strongest Tide!

This boring operation was conducted by the E. J. Longyear Exploration Co. of Minneapolis, to whom the Haviside Company chartered the Haviside No. 4.

Haviside Barge No. 4 anchored off Fort Point, in the Golden Gate, engaged in boring for foundation of the proposed Golden Gate bridge, held securely in place with AMERICAN WIRE ROPE. Conquering a run-out of 8'6", according to tide tables—a record tide caused by heavy rain freshets and aggravated by storms. The barge was held on location with its own anchorage equipment and five additional anchors, to which were attached AMERICAN WIRE ROPE CABLES.

The method of boring was to hold a drill-cage resting on the sea bottom, secured in place by seven anchors attached to the drill-cage with American Wire Rope.

AMERICAN

STEEL AND WIRE COMPANY

SUBSIDIARY OF UNITED STATES STEEL CORPORATION.

Pacific Coast Distributors

UNITED STATES STEEL PRODUCTS CO.

SAN FRANCISCO LOS ANGELES PORTLAND SEATTLE VANCOUVER, B. C.

Pacific Shipyards—See Workboat Notes ... 193
Pacific Tank Gauge Co. ... 516
Package Research ... Dec. 29
Packing, Some Notes on Export ... Mar. 25
Page, Chas. R. ... July 27, 385
Page Bros. ... Apr. 21
See also Freights, Charters, Sales
Pan-American fuel oil ... 68
Panama Canal, California Gasoline through the ... Sept. 27
Some Coal Records at Cristobal ... 121
Radio Beacons to Guide Ships to the ... 113
Panama Pacific Line ... Nov. 19
See also steamships California, Virginia and Pennsylvania
Panama Railroad Company ... 93
Panther, Jr., Joseph ... 404, Nov. 27
Paracoil equipment—See Davis Engineering Co.
Parke & Kibele, engineers ... 126, 515
Parker, Wilder & Co.—See Hualalai ... 269
Parks Co., Harry S.—See Santa Clara ... 487
Parr Terminal Co. ... 410
Parsons triple expansion turbines—See Statenden ... 459
Passing of the Bath Steward ... 120
Paulsen, Captain Andreas C. ... Sept. 19
Pennrich & Co. (Torfoleum) ... 381
Pennsylvania, steamship ... 310, 444, 449, 469
Percival, Captain John ... Dec. 23
Perishable Cargoes, The Care of. By David W. Dickie ... 368, 418
Perkins, Ensign G. Stephen: The United States Naval Reserve 274
Perow, William G.—See An Improved Cargo Separator ... 197
Peterson, A.: Geared versus Electric Drive for Merchant Vessels 372
Peterson, Chief Engineer Harry ... Jan. 33
Petty & Wherry—See Trade Note ... 193
Philippines, Shall the American Coastwise Laws Be Extended to. By Jas. H. MacLafferty ... 101
Cargo Handling Facilities at Philippines Ports. By V. Aldanese ... 144
Pacific Coast Fresh Fruits in the ... 280
Direct Philippine Service ... July 29
First Regular Direct Service to Philippines ... Aug. 23
Pickard, Byron O.: The Economics of Safety ... 406
Pipe, How to Bend a ... 65
Pitchometer Company—See Tingaard ... 514
Pittsburg, dredger ... 470
Plant Mills indicator—See Hualalai ... 268
Plant Rubber and Asbestos Co.—See Hualalai ... 270
Pneumercator Co.—See Asama Maru ... 492
Pollister, Edward B. ... 252
Port Problems, New York. By N. F. Titus ... 97
Port of Yuchu (Canton, China) ... May 25
Port Notes ... Mar. 29, May 25, Aug. 25
Porter, G. Harold ... 383
Portland (Oregon) ... 319, 339, 359
Prescott Worm-Drive Tractors ... 76
President Adams, steamer ... 238, 265
President Johnson, steamer ... Mar. 11, Mar. Insert A
Prest-O-Lite ... 163, 382
Prest-O-Weld ... 512
Princess Mary, World's Largest Lifeboat ... Sept. 29
Prince Rupert Dry Dock & Shipyard ... 155
Propeller Club of San Francisco ... July 25, Sept. 23, Nov. 31
Propulsion Machinery, Problem of Choice in ... 195
Modern Ship Propulsion. By A. Kennendy Jr., and R. A. Beekman ... 500
Pulverized Fuel for Marine Purposes During 1927-1928, Development of. By Carl J. Jefferson ... 22
—Coal Burners, Todd ... 32
—Coal Steamers, Two New. By H. M. Wick ... 325
—Coal Steamer West Alsek ... 326
Pusey & Jones Corp., The ... 108, 232, 338, Aug. 29, 463
Push Button, Lincoln Safety ... 116

Quimby Pumps ... 59, 268, 383
Quinby, James A.: See Marine Insurance.

Radiant, cruiser ... 206
Radio—Wireless Phones for Airships ... June 25
Radiobeacons to Guide Ships to the Panama Canal ... 113
Ship Repair by ... 95
Radio Corp. of America ... 95, 198, 383, 449
Raecolith flooring—See W. B. Foshay ... 402
Ranarex carbon dioxide indicators ... 268, 358
Ray Manufacturing Co., W. S. ... 119, 235, 236, 251, 270, 282, 358, 467, 516, Dec. 25
Record? What is the Nonstop (De La Vergne diesel) ... 421
Rectigon charger ... 404
Redwing engine—See Workboat Notes ... 240
Refrigeration—Ocean Shipping of Fresh Fruits ... 189
Waterfront Cold Storage. By J. R. West ... 408
Care of Perishable Cargoes. By D. W. Dickie ... 368, 418
Efficient Insulation of Cold Storage Rooms ... 381
Refrigeration on Pleasure Boats ... 424
Regulations for Motorship Engine Room, New (Hamburg) ... 458
Repair by Radio, Ship ... 95
Rescues at Sea ... 49
Research, Package ... Dec. 29
Rich smoke detection system ... 15, 72, 268, 357, 358, 449, 492, Dec. 31
Richmond (California) Port Development ... 410
Rio Grande Oil Co. ... 250
Rix Company, Inc. (air compressor) ... 187, 424
Roberts, Captain F. W. ... Nov. 29
Roberts, Captain James ... Jan. 37
Roberts type boiler ... 282
Rock gas cooking range ... 24
Rohlfs, J. C. ... Feb. 11
Rope—Roping an Island out of the Fairway (Tubbs Cordage) ... 117
Safety in the Use of Wire Rope. By I. L. Stone ... 291
Chart showing rope used on U. S. Constitution ... 379
Rosalia, clipper ship. The Don Juan, Ex-?. By F. C. Matthews ... 367
Rotterdam Dry Dock Company ... 293
Rowland, Professor T. C. ... 237
Rudder Shape on Steering Ability, Influence of. By Prof. C. F. Gross ... 157
Rustless Steel Propellers (Warman) ... 336

Safety—Fuel and Safety. By Arthur M. Tode ... 56
—Shoes ... 159
—The Management's Job. By Robert F. Hand ... 183
—of Life at Sea (Editorial) ... 265
—in the Use of Wire Rope. By I. L. Stone ... 291
Pacific Marine Safety Code. By F. C. Gregory ... 365
Sea Safety Concepts of a Seaman. By Capt. Thos. W. Sheridan ... 400
The Economics of Safety. By Byron O. Pickard ... 406
First Aid Station on Norton, Lilly pier ... 407
Pacific Coast Marine Safety Code ... 412
Recent Progress in the Safety of Stevedoring Operations. By Frank C. Gregory ... 441
Statistics in Maritime Accident Prevention. By Arthur M. Tode ... 453
A Safety Acrostic (S. O. Bulletin) ... 455
Saga, yacht ... 423
Sailing ships—See Windjammer Crews ... 443
Clipper Ship Surprise ... May 11
See Also Matthews, F. C.
Sal Log ... 466, 492, Dec. 31
Salvage King, tug ... 244
San Francisco—Premier Port of United States in Dry-Dock Equipment ... Oct. 13
Liner Day at ... Nov. 19
San Francisco, motorship ... 381
San Pedro Boat Building Co. ... Sept. 29, Dec. 33
Santa Clara, steamer ... 485
Santa Inez, motorship ... June 27
Schaphorst, W. F.: Greatest Speed on Earth ... 64
Kinks, Cautions, and Suggestions ... 151
A Convenient Calculating Graph ... 460
School ship, California ... 177, 265, 278, 255
Schutte Koerting heaters ... 59, 487
Schwanhausser, E. J. ... 428, Nov. 25
Seamen, Public Health Service for ... 277
Searsport (Maine) ... 51, 100
Seattle ... 295, 365, 408, 497
Selbalith (Selby Battersby Co.) ... 14, 487
Selex fire detection system—Selective Fire Detection ... 427
Self, Captain Arthur M. ... Oct. 23
Separator, An Improved Cargo (Wm. G. Perow) ... 197
Shaeffer Terminals, Tacoma ... Oct. 23
Sharples Specialty Co. ... 163, Apr. 25, 205, 233, 282, 421, 466, 487, 492
See also ... 163, Apr. 25, 205, 233, 282, 421, 487, 492
Shaw Metal for Marine Bearings. By Nelson Shaw ... 378
Shaw, Captain Frank N.: Windjammer Crews ... 443
Sheedy, Joseph E. ... May 17
Shelikof, cannery tender ... 327
Shepard Electric Crane & Hoist Co. ... 15
Shepard Steamship Co. ... 201
Sheridan, Captain Thomas W.: Sea Safety Concepts of a Seaman 400
Shinomiya, Captain G. ... Oct. 23
Ships, Two New Super. By H. M. Wick ... 135
Shipbuilders Deserve Square Deal, American ... 49
Shipbuilding—Some Interesting New Ships Building Abroad ... 283
Shipbuilding Program Launched (S. S. Santa Clara) ... 485
The Shipbuilding Status (Editorial) ... 354
American Shipbuilding ... 42, 82, 126, 170, 214, 258, 302, 346, 390, 434, 478, 522
Shipmasters, Home Port of American (Searsport) ... 51
Two Famous American Shipmasters "Cross the Bar" ... 100
Shipmate range ... 295, Sept. 29
Shipowners Association of the Pacific Coast ... 133, 403, 412
Shipping—An American Freighter in the Orient. By F. B. Michelson ... 17
Shall the American Coastwise Laws Be Extended to the Philippines. By Jas. H. MacLafferty ... 101
Norwegian Merchant Marine ... Mar. 23
Ocean Shipping of Fresh Fruits ... 189
Some Resolutions Affecting Directly or Inndirectly America's Marine Policy (U.S. Chamber of Commerce) ... 221
The Business of the Sea. By James A. Farrell ... 226
Pacific Fresh Fruits in the Philippines ... 280
Seagoing Pomological Laboratory ... 281
An Analysis of United Statets Shipping ... 309
Improved Transpacific Transportation (Matson) ... 457
See also Foreign Trade.
Silvermaple, motorship ... 95
Silverhazel, motorship ... Jan. 43
Simmons Company ... 5, Mar. Insert A-F, 268, 358, 444, 448, 502
Sir William Hoy, tug ... 279
S. K. F. Co.—See Tidewater ... 233
Skansie Shipyard ... 155, 328, Nov. 37
Smith, Frank V.: Propulsion Machinery of the Virginia ... 10
Operating Economies of the All-Electric Ship ... 184, 229
Pennsylvania's Electric Power Plant ... 449
Smith Transportation Co. ... 155
Smith, Chief Officer Robert W. ... Aug. 19
Smith, Sir William Reardon ... Jan. 43, July 17
Society of Naval Architects and Marine Engineers ... 22
South African Dispatch Line ... 467
South American Service, Improved (Wesfal-Larsen Line) ... Sept. 25
Southern Pacific Company ... 205
Speed on Earth, Greatest: By W. F. Schaphorst ... 64
Measuring Speed of the World's Fastest Liner (Bremen) ... 466
Sperry Gyroscope Co., Inc.—Sperry Gyro. Inc. ... 200
See also 13, 14, 35, 72, 119, Apr. 21, 208, 233, 235, 278, Aug. 29, 358, 449, Nov. 37, 487, 492
Squires and Jones—New Jersey Asbestos Co. ... 213
Stamford Foundry Company ... 295
Standard Gas Engine Co. ... 240, 328
Standard Oil Co.—Calol turbine oil ... 268
See also ... 113, 234
Standard Motor Construction Co. ... 282, Oct. 29, Nov. 37
Standard Shipping Co. ... 223, 455
Standard Unit Navigation Co. ... 382, 422
Stanley Forge, steamer ... 103

Stars of the Pacific, Famous, III, bark Willscott ... 312
Staten Island Shipbuilding Co ... 470
Statendam, steamer ... 459
Steam Generation Afloat, Modern ... 18
—Very Much Alive (Editorial) ... 94
Improved Fuel Consumption with Marine Steam Plants. By R. Z. Dickie ... 161
Geared versus Electric Drive for Merchant Vessels By A. Peterson ... 372
Stellite ... 212
Stephens Bros ... 154, 463
Sterling Engine Co ... 113, 156, 161, 206, May 15, 237, July 27, 329, 401, Sept 29, 424, 463
Stiles, Herbert M. ... Apr. 19
Stone, I. L.: Safety in the Use of Wire Rope ... 291
Stone Electric watertight doors ... 492, Dec 31
Stratford Oakum Co ... 248
Sturtevant Co., B. F. ... 449
Submarine Signal Corporation—See Fathometer
Sulzer Bros Diesel Engine Co.—See Asama Maru ... 492
Sun Shipbuilding Co ... 251, 282, 331
Sunde & d'Evers Co. ... 69
Superheater Co.—Trade Note (Robert M. Gates) ... 119
Surgex electrical dishwasher ... 270
Surprise, clipper ship ... 177
Susan B. Luckenbach, steamer ... 513

Tacoma ... 237, 244, 332, 404
Taftinder, Captain Sherwoode A ... Oct. 17
Tahoe, Coast Guard cutter ... 113
Tanana, seiner ... 329
Tankers—The Oil Tanker ... 134
Diesel-Electric Tanker for the Tide Water Oil Co ... 108, 463
Delta Standard ... 113
Two New Diesel-Electric Shallow Draft Tankers (Sun Oil Co.) ... 251
Taylor Instrument Companies ... 36, 368, 358
Tennessee Coal, Iron and Railroad Co.—See Warrior ... 198
Terminal, A New Type of (Chicago Tower) ... 180
Terminal Economy and Cargo Management ... 317
Economy and Cargo Management. By A. F. Haines ... 382
Comparison Between Leases, Preferential Assignments, and Direct Operations of Port Terminal Properties By Philip H. Carroll ... 364
See Also Refrigeration
Tervitsos, Captain C. D. L. ... June 19
Texas Company—See Tode, Arthur M.
Thompson, A. W. ... 36
Thorkote Products Co.—See Humuula ... 358
Tide Water Oil Co ... 71, 108, 232, 338, 463
Timken-Equipped Compressors, Worthington ... 337
Tingard, revenue cutter ... 511
Titus, Norman E.: New York Port Problems ... 96
Tobey, Captain William, Jr. ... 100
Todd Shipyards Corp ... 32, 111, 153, 203, 208, 250, 257, 326, 382, 425, Oct 23, 465
... Nov 23
Tode, Arthur M.:
Fuel and Safety ... 56
Statistics in Maritime Accident Prevention ... 453
Torfoleum—Efficient Insulation of Cold Storage Rooms ... 381
Torfrey, steamer ... 109
Trade Literature ... 41, Jan. 43, 105, 109, Feb 25, Feb 27, 115, 161, Apr. 21, Apr 25, 250, 292, 295, 339, Aug 27, 383, 384, 421, 428, 470, 471
Transportation Trends. By Roger D. Lapham ... 354
Trask, Commodore J. A. ... Jan. 33
Travis, Stuart—See Virginia, Pennsylvania
Triddoc chain tackle ... 187
Treiber Diesel, The ... 301
Trench pump—See Three Super-Fishing Vessels ... 377
Triumph and Defiance—Complete electrification ... 203
Trucks and Tractors—See Elwell-Parker-Lewis-Shepard ... 117, 240, 252
Tubbs Cordage Co
Tubes—See Condenser
Tug, World's Most Powerful (Sir William Hoy) ... 279
British Harbor Tugs. By R. C. W. Courtney ... 330
Tulega, steamer ... 165
Turbine—New Design Turbo-Generating Sets ... 18
Improved Performance of Geared Turbine Drive (S. S. Dixie) ... 101
Geared Versus Electric Drive for Merchant Vessels By A. Peterson ... 372
Turpel Marine Railways ... 193
Twenty-five Years Ago ... 223, 266, 311, 358, 487
Twigg & Sons, John—See Exhibit at Motorboat Show ... 240

U. S. Grant, transport ... 169, 170
Union Carbide and Carbon Co. (See Also Linde Air Products Co.—Prest-O-Lite Co.—Oxweld Acetylene Co.) ... 160
Union Diesel Engine Co ... 24, 41, 68, 242, 376, 461
Union Oil Co.—Union Oil in the Antipodes ... Feb. 25
Gives Super Service ... Nov. 23
See Also ... Feb 21, 157
United Dry Docks, Inc.—Gotham's New Dry Dock Combination ... 204
A Thousand Passengers in Dry-Dock Five Days ... 315
See Also ... 252, 318, 470
United States—
—Chamber of Commerce ... 178, 221
—Coast Guard ... 28, 58, 113, 246, 247, 514
—Coast & Geodetic Survey ... 242, 266, 328
—Department of Commerce ... 188, 284
—Lighthouse Service ... 109, 113, 516
—Naval Reserve, The. By Ensign G. Stephen Perkins ... 274
Shipping Board ... 93, 131, 158, June 29, 277, 326, 355, 377
—Steamboat Inspection Service ... 51
United States Rubber Co.—See Virginia ... 14
United States Lines ... 93, 135
Universal Generating Set—See Delta Standard ... 113

Valjean oil burner ... 516
Valve, A Leakless Globe (Collar) ... 294
Vancouver (British Columbia) Development of the Port of ... 192
See Also ... 148, Nov. 37
Vancouver (Washington) ... 232
Vancouver Shipyards, Ltd. ... Nov. 37
Vehisote ... Mar. F, 238, 269
Vestris—See Another Story of the Great Atlantic Storm ... 223
Victor dishwashers—See Virginia ... 14
Victoria (British Columbia) ... 193, 213, 244
Victoria Pile Driving Co ... 193
Victory flushometer—See President Johnson ... Mar. Insert A
Viking diesel engine—See Workboat Notes ... 240
Virginia, steamship ... 5, 9, 10, 13, 14, 72, 71, Feb. 15, Oct. 13
Voorhees, J. T ... 340
Vulcan, fireboat ... 156
Vulcan refrigerator—See Hualalai ... 268

Waaleale, steamer ... 502
Walker & Son, Ltd., Thos.—See Asama Maru ... Dec. 31
Wallace, W. C. ... June 15
Ward Engineering Works, Chas.—See Dwight F. Davis ... 287
Ward-Livesey Co. ... 66
Waring and Gillow—See Asama Maru
Warman Steel Casting Co.—Rustless Steel Propellers ... 336
Warren Pump Co. ... 30, 59, 72, 268, 449
Warrior, towboat ... 198
Washington Iron Works (Washington-Estep Diesel) ... 58, 66, 68, 155, 164, 199, 240, 242, 328, 329, 402, 403, 420, 424, Oct. 29
Washington Navigation Co ... 328, Nov. 37
Waterfront Cold Storage. By J. R. West ... 408
W. B. Foshay, motor ferry ... 164, 244, 402
Wearever kettles—See Hualalai ... 270
Webb ship range ... 516
Weir pump—See Statendam ... 460
Welding—Bronze Welding a Diesel Engine Frame (Oxweld) ... 115
Improved Welding Gloves ... 115
An All-Welded Steel Yacht ... 331
Arc-Welded Steel Motorboats (Lincoln) ... 335
Unified Control of Stable-Arc Welding (Lincoln) ... 338
New Westinghouse Dual Drive Welding Unit ... 511
Welded Steel Shipbuilders—See Pacific Boatyards Notes ... 515
Welin Davit and Boat Corp ... 14, 487, 492
Wellman-Seavers-Morgan Company ... 511
West, J. R.: Waterfront Cold Storage ... 408
West Alsek, steamer ... 158, 326, 465
Westco water supply system—See Eleu ... 256
Western Boat Building Co. ... 67, 242, 328, 332, 46
Western Blower Co. ... 268, 356
Western Engineering Co. ... 268, 296, 358
Western Machinery Co. (Western-Enterprise engines) ... 67, 199, Sept. 29, 515, Dec 33
Westfal-Larsen Line—Improved South America Service ... Sept 25
Westinghouse Electric & Manufacturing Co.
Developments in 1928. By H. C. Coleman ... 31
Creates Diesel Department (C. J. Lamb) ... 163
Merrick Elected President ... 310
Develops New Metal (Konel) ... 427
Sharples-Westinghouse Oil Centrifuge and Filter ... 466
Dual-Drive Welding Unit ... 511
Largest Contract for Materials Handling Awarded ... 511
Trade Literature ... 383, 428, 470, 471
See also 58, 110, 113, 187, 200, 216, 217, 268, July 13, 282, 295, 334, 356, 376, 382, 422, 424, 461, 502, 513
Weule Co., Louis—See Humuula ... 358
Wheeler-Osgood Co.—See W. B. Foshay ... 402
Wheeler Manufacturing Co., C. H.—See Virginia ... 14
White Star Line ... 420, 493
White system of oil firing—See Statendam ... 460
Whitehead, Chief Engineer George ... Feb. 19
Whitelaw, Captain P. T. H ... May 21
Who's Who Afloat and Ashore Jan. 33, Feb 15, Mar. 15, April 15, May 15, June 15, July 15, Aug 15, Sept 15, Oct 15, Nov 23, Dec 19.
Wick, Harold M: Two New Super-Ships ... 135
Two New Pulverized Coal Steamers ... 327
Wilavia, tug ... 155
Willamette Iron & Steel Works ... 328
Willard batteries ... 241, 427
Williams, George E ... 52
Willis, John S ... May 19
Willscott, bark ... 312
Wilson, James L.—See Hualalai ... 268
Windjammer Crews ... 443
Winton Engine Co.—New 8-Cylinder Diesel ... 512
See also ... 29, 108, 154, Aug. 29, 423, 462, Dec 33, 516
Wood, International Trade in ... 196
Worden & Co., W. H.—See Washington Iron Works—
See also ... July 27
Workboats and Their Power Plants 21, 26, 66, 110, 116, 120, 154, 199, May 27, 240, 286, 328, 376, Sept. 29, 422, Oct. 29, 461, 462, 463, Nov 37, 514, 516, Dec 33
World Engineering Congress—See paper read at ... 500
Worthington Pump & Machinery Corp—Appointment of Jos. Hecking ... 29
Timken-equipped Compressors ... 337
New Manager, Buffalo Works (E. J. Schwanhausser) ... 428, Nov. 25
See also ... 235, 383, 449, 485, 516
Wrang, George ... 328

Yacht, An All-Welded Steel ... 331
Yale & Towne Mfg. Co.—Service Building ... 76
See also ... 192, 516
Yankee Girl, trawler ... 427
York refrigerator ... 110, 376
Young Bros.—See Mikimiki ... 288
Yuchu, Port of (Canton, China) ... May 25

Zipf, A. E. ... Nov 23
Zwallow, cruiser ... Sept 29

Welcome, Virginia, To the Pacific!

Pacific Marine Review

JANUARY, 1929

Official Organ

Official Organ SHIPOWNERS' ASSOCIATION

Pacific Marine Review, Vol. 26, No. 1. Published Monthly at 576 Sacramento Street, in San Francisco. Entered as second class matter at the post office at San Francisco under the act of March 3, 1879.

Chinese Junks—

From Wood Block
By JUDSON E. STARR

Pacific Marine Review

The National Magazine of Shipping

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

Entered as second class matter June 20, 1913, at the post-office, San Francisco, under the Act of March 3, 1879. Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 15th. Subscription price, a year, domestic, $2; foreign, $3; single copies, 25c

Official Organ Pacific American Steamship Association

James S. Hines, President and Publisher.

Bernard N. De Rochie, Vice-Pres. and Manager

Official Organ Shipowners' Association of the Pacific

Alexander J. Dickie, Editor

Paul Faulkner, Advertising Manager

The Famous Ship Great Admiral

By F. C. Matthews.

The famous American sailing ship Great Admiral.
—From painting by Charles R. Patterson

FROM her launching and until the advent of the ship South American in 1876, the Great Admiral was conceded to be the finest wooden merchant ship afloat. She slid down the ways in the yard of her builder, Robert E. Jackson, East Boston, on April 10, 1869, having been built to the order of William F. Weld & Co. This firm had outlasted most of the merchant shipowning houses of Boston, and after the Civil War had the largest sailing fleet in America. The ship was designed by Naval Constructor W. H. Varney, U.S.N., and was named in honor of Admiral Farragut, a finely carved full length image of whom was her figurehead.

Everything pertaining to the Great Admiral was of the very best quality, not omitting the mechanical and workmanlike manner of her construction, the beauty of her lines, and general grandeur of her appearance. The frame was of superior white oak, molded large and very square, 19 inches at the keel and 7 inches at the gunwale. Sided 11 to 14 inches timber, fayed closely together and doweled with lignum vitae dowels 3 inches in diameter. Hole bored in end of every timber and salted. A course made in every joint of frame, outside and in, for air and salt. Every hanging knee bored through throughout. Also course through the whole length of knee for air and salt. Keelson of yellow pine, three tiers, 16 inches square, well trussed under masts and dowelled. Keel of white oak in five pieces, 16 by 20 inches; 9 inch shoe. Bottom planking, white oak $4\frac{1}{2}$ inches thick. Twenty-five wales on a side, of yellow pine, $5\frac{1}{2}$ inches thick. Lower deck and second beams, yellow pine, 16 inches square. Not one iron spike, bolt, or nail was used outside, all such fastenings being of copper from keel to monkey rail. Upper deck

and houses also were fastened with copper. Eye-bolts, ring-bolts, chock-rims, and other iron fittings about decks were all galvanized.

There was used in her construction: 105 tons of iron, 20 tons of copper, 253 hogshead of salt. Her three anchors weighed 12,601 pounds, the first bower weighing 4681 pounds. Weight of chains, 33,950 pounds. Capacity of water tanks, 6900 gallons.

During the twenty-eight years of the sea life of the Great Admiral under the Black Horse house flag of W. F. Weld & Co., she was always kept in perfect order. In spite of having been driven hard to make fast voyages, when she was opened up at San Francisco for reclassing in January 1889 her beams were found to be nearly as good as when she left the builder, and throughout she was reported as showing up in good condition. Prior to her sale in 1897 she had had but four masters, Captains Isaac N. Jackson, William Chatfield, Benjamin Thompson, and J. E. Rowell, all of whom were justly proud of their command, which at every port visited was the subject of much favorable comment by maritime journals. The Great Admiral was as a rule singularly fortunate in escaping damage by the elements, and her cargoes turned out in excellent condition.

The dimensions of the ship were: Length, 215.6 feet; breadth of beam, 40.2 feet; depth of hold, 25.6 feet; tonnage, 1575.68 gross; 1497 net. In model her lines approached those of a medium clipper, her ends being rather long for a cargo carrier. Her cargoes of wheat in bags loaded at San Francisco generally ran a trifle over 2000 long tons, or one-third in excess of her net register. She was well sparred, spreading 7889 yards of canvas in a single suit of sails. During the first years of her career she carried three mates, a boatswain, a steward, a cook, a carpenter, and twenty-eight seamen. In 1897 she was handled by twenty-three men all told, including the captain.

During the twenty-eight years under the ownership of W. F. Weld & Co. she covered a distance of 726,968 miles in 5360 sailing days, an average of 135.6 miles daily. The greatest distance sailed in any one day was 305 miles and the greatest distance in any 10 consecutive days 2735 miles, of which 304 miles was the best day and 210 the poorest.

While the Great Admiral broke no sailing records, she always made passages faster than average, and in nearly all instances reached her destination in advance of competitors sailing in company or nearly at the same time. In addition to the details quoted regarding the construction of the ship, the Weld office has very courteously furnished a complete record of all voyages made prior to 1897, and from this list it is ascertained that the greatest number of passages made over any one long course was seven from New York to San Francisco. The average of these is 122 days, with 133 days as the longest, when the distance sailed was 17,486 miles and the daily average 131½ miles. There were also seven runs from San Francisco to various ports in England, Ireland, and France, which averaged 115½ days. Of these, the slowest was to Havre, 126 days; sailed 16,083 miles at a daily average of 127½. Three passages were made from Liverpool or Cardiff to Hong Kong in 99,107 miles and 121 days, with daily averages of 156, 143, and 128 miles. On one of the runs from Cardiff, Anjer was passed on the 77th day out.

From the Philippine Islands to New York or Boston the average of six passages is 114 days, the longest being 130 days; Manila to Boston, 114 miles daily average. From New York or Boston to Melbourne or Sydney there were five passages averaging 88 days; longest 98 days, New York to Melbourne, sailing 13,916 miles at an average of 142 miles daily. From Hong Kong to New York two runs were made; 95 days in 1884 at an average of 148 miles; and 104 days in 1890, averaging 137 miles.

From San Francisco to the Philippines five passages were made, four being to Manila and one to Iloilo. These were all excellent runs, 43, 44, 43, 46, and 45 days; averages daily, 167, 171, 178, 154, and 151½ miles. From San Francisco to Hong Kong, five passages averaging 49 days and from Hong Kong to San Francisco seven passages averaging 48 days.

The following are her notable passages:

	Days	Miles	Average Daily
New York to San Francisco	111	16,290	147
San Francisco to Queenstown	111	16,182	146
San Francisco to Liverpool	113	16,781	148½
Philadelphia to Tacoma	111	16,055	145
(On this passage she made Cape Flattery in 106 days from Delaware Breakwater.)			
San Francisco to Hong Kong	37	7,097	192
San Francisco to Manila	43	7,642	178
Hong Kong to San Francisco	38	5,969	157
Hong Kong to San Francisco	39	6,464	166
Newcastle, N.S.W. to Hong Kong	37	4,986	135
Manila to New York	89	12,656	145½
Hong Kong to New York	95	14,069	148
New York to Sydney	90	14,255	158½
New York to Melbourne	73	13,745	188
Sydney to London	92	14,234	155½

On a voyage from Hong Kong to San Francisco in 1887, the rudder head was sprung in a typhoon and Captain Rowell put into Hakodate for repairs. Her time from the latter port to San Francisco was 25 days, a very fine run. On her passage of 39 days from Hong Kong to San Francisco in 1888 she passed Yokohama 16 days out and was 23 days thence to the Golden Gate, crossing the Pacific in latitude 39.

The last voyage made by the Great Admiral under the Weld ownership was in 1896, when she went to Melbourne from New York in 91 days; from Hobart to Gibraltar, 90 days; thence to Marseilles, 8 days; Marseilles to New York, 48 days. On March 16, 1897, she was sold to Captain E. R. Sterling for $12,500, and, to quote from Captain Rowell, "the Black Horse was hauled down for the last time from the last survivor of that great fleet which carried it the world over for years."

The new owner of the Great Admiral took over her command and for some nine years she was engaged in the export lumber trade from Puget Sound, taking large cargoes to ports in the Pacific and to South Africa. Her end came in December, 1906. When four days out from Port Townsend bound to San Pedro, California, she encountered a hurricane and sprung a bad leak, practically filling with water and going over on beam ends. The main and mizzen masts were cut away, after which the jibboom was carried away, taking with it the foremast. The ship was now a complete hands were clinging to the top of the after house when wreck, with top work and deck load washing away. All hands were clinging to the top of the after house when it was washed off to leeward clear of the wreck. This was then broken into two parts by floating wreckage. After passing two nights under terrible exposure, during which the cook and cabin boy died, the remainder of the ship's complement were rescued in an exhausted condition by the ship Barcore of Liverpool, Captain MacKenzie, bound to Adelaide from Vancouver.

Three Books of the Sea and Ships

THE journal of an adventurous and observant wanderer contacts the active mind of an able and conscientious editor, and that contact starts the labor which brings forth a worthwhile book. Such was the process of generation resulting in JOHN CAMERON'S ODYSSEY, transcribed by Andrew Farrell, a delightful volume of South Pacific and other ocean wanderings.

John Cameron, starting out of Glasgow as a boy on a sailing ship, looked with open mind at the waterfronts of New York, San Francisco, and way ports, flirted for a season with the lumber schooner trade and then, for thirty years, wandered the South Pacific with Honolulu as a home base. Blackbirding, pearling, copra trading, inter-island steam navigation service are all one to this cosmopolitan Scot who comes whole out of every adventure, ready for another, and keeping notes on all of them.

Andrew Farrell, the transcriber of this work, needs no introduction to readers of Pacific Marine Review. Associated editor for several years in the hectic shipbuilding days of 1919 to 1921 and the slump that followed thereon, Farrell impressed his forceful personality on much of the editorial comment and feature articles of this magazine, to which he is still an occasional and very welcome contributor.

Working together over a period of years, and handicapped by separation, Farrell being in Hawaii and Cameron in Japan, these co-workers had not finished their task when Cameron died. Farrell completed the revision of the book, and with the approval of Cameron's widow it has been published in its present form. Farrell has done a very masterly job at editing. John Cameron is there in all his crudeness, shrewdness, joviality, and force, framed and enhanced by occasional strokes of Farrell's trenchant pen.

Here is a bit from the preface:

". . . . Many, many years ago the master of all writing folk related the deeds and misdeeds of a very gallant rover. This person was the first great adventurer; he saw land and sea with eyes glad and unclouded, and met both good and evil merrily; he was a man of storm and shipwreck, he came to new countries and strange peoples, and for a time abode with them, and traveled toward far horizons that always advanced as he moved. Since his day innumerable companies have followed his course. Their frozen bodies toss in the Northern ice pack, their skeletons bleach on equatorial atolls; yet still they come and will come, spendthrift of youth, prodigal of strength, leaving scarcely a name behind them; but in their wake colonies and empires strangely arise under alien stars. To them I should like to dedicate "John Cameron's Odyssey," to the unknown hordes who have emulated that archetype of wanderers, that honey-tongued, wily, audacious, lion-like rogue and gentleman, Odysseus of the hardy heart."

The McKay Clipper Sovereign of the Seas.
From painting by C. R. Patterson. Frontispiece of Book "Some Famous Clipper Ships and Their Builder—Donald McKay."

F. C. Matthews, of San Francisco, an acknowledged authority on sailing ships, says of this book:

". . . . while I have had time to only glance over it, it seems to be a book worth while, carefully written, and authentic in its statements. Apparently the last thing to be said about old times in the South Seas trading and 'blackbirding' business—a book of great historical interest that should be in the hands of all lovers of sea tales."

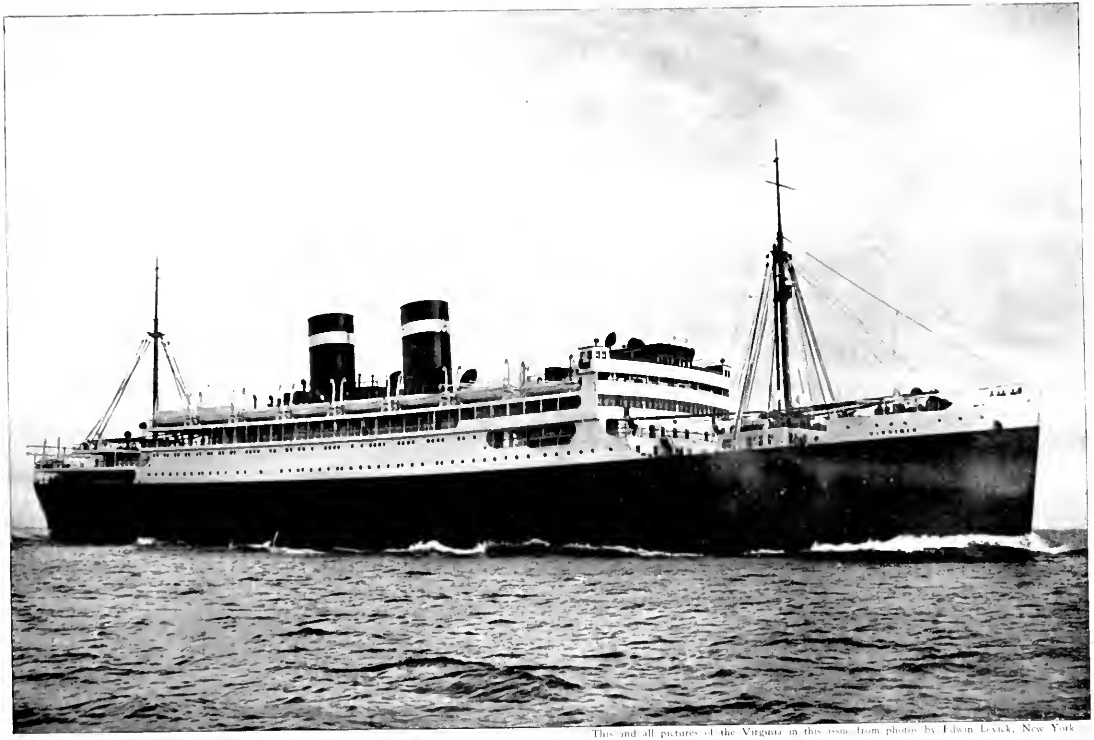
Be that as it may, we want to say personally that we are very glad that Captain John Cameron met Andrew Farrell, and that this meeting resulted in so very readable a modern Odyssey. Apparently there are many others who agree with us, for on ordering some copies of this book for friends, we were told that the first printing had been sold out in New York and we would have to wait.

The pen and ink sketches by Charles Kuhn scattered through the text, and the half tone engravings from rare old photographs enhance the interest of this fine product of the publishing house of MacMillan, New York.

Another noteworthy book of recent production is the long-awaited, much-heralded biography entitled SOME FAMOUS SAILINGS SHIPS AND THEIR BUILDER, DONALD McKAY, by Richard C. McKay of New York, grandson of the master shipwright.

This volume, with its sixty illustrations, is a credit to the publishing house of Putnam and a pleasure to the eye. Especially noticeable are the ten beautiful full-page illustrations in color, reproduction from noted paintings of Donald McKay's masterpieces. Several of these are from the brush of Charles R. Patterson. A foreword by James A. Farrell pays a glowing tribute to the genius of Donald McKay and eloquently appreciates his great contribution to America's maritime su-

(Continued on Page 47)



This and all pictures of the Virginia in this issue from photos by Edwin Levick, New York

Virginia, New Queen of Intercoastal Fleet

Length over-all	613'3"	Displacement, tons	32,830	Shaft horsepower	17,000
Beam ..	80'0"	Passenger capacity, First	400	Sea speed, knots	18
Depth, molded	52'0"	Tourist	400	Fuel capacity, tons	5,349
Depth, keel to upper deck	100'0"	Freight capacity, tons	8,500	Cruising radius, miles	16,000

A New Intercoastal Queen

Panama Pacific Electric-driven Liner Virginia, an Enlarged and More Beautiful California

THE new twin screw 32,830-ton turbo-electric liner Virginia of the Panama-Pacific Line, the largest steamship ever built in America, was delivered to her owners and arrived in New York, November 28. After outfitting and furnishing she sailed December 8 on her maiden voyage in the intercoastal run. Commanded by Captain H. A. T. Candy, senior commander of the line, she arrived in San Francisco on December 24, a very handsome Christmas package for the great harbor inside the Golden Gate.

The Virginia is regarded by her builders as the finest merchantman ever fashioned at the Newport News Shipbuilding and Drydock Company plant, and has been classed by the American Bureau of Shipping to its highest rating. At her sea trials she was introduced to the Atlantic Ocean, on which she will travel as one of a proposed fleet of six Panama Pacific liners in the coast to coast trade. She moved majestically through the gateway of the Virginia Capes before sunrise on November 19, and when well out to sea was called upon to give a full account of herself before delivery to her owners. It was her trial trip—an exacting test lasting twelve consecutive hours. Nothing in her performance escaped the critical attention of the many shipbuilding experts aboard, and as she warped into her dock at nightfall it was the concensus of opinion that the Virginia exceeded their highest expectations.

Second Unit of New Fleet

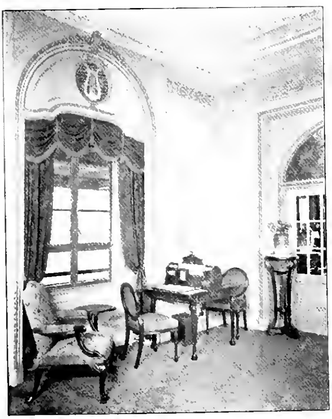
This second great unit in the extensive building program of her owners, the International Mercantile Marine Company, is virtually a sister ship of the California, the first ship of the new fleet, which entered the service last January. The hull of a third ship is now taking shape rapidly on the ways from which the Virginia was launched and is expected to be ready for service in December 1929.

The Virginia is 613 feet long, has a beam of 80 feet displacement 32,830 tons, depth of hull 52 feet, and a total depth of 100 feet from upper deck to keel. She is designed to carry over 800 passengers, 400 in first cabin and 400 in tourist cabin, and has a capacity of 8500 tons of perishable and semiperishable freight. Her speed is $21\frac{3}{4}$ statute miles an hour, which will enable her to make the run of 5600 miles between New York and California in 13 days.

A Luxury Liner

To travelers seeking comfort and luxury at sea, the Virginia will make a strong appeal. She has all the attractive features and luxurious appointments of a modern transatlantic liner, including great size, and has as well many innovations designed to meet the variations of weather encountered on her long voyages through the tropics and the north temperate zone.

The outstanding features of construction, convenience, and elegance which have attracted worldwide attention in the California, have also been incorporated in the new ship. These include, among



Above is shown a corner of the beautiful lounge on the Virginia. The window is the new Kearfott-Kawneer casement. Constructed of extruded bronze, fitted with mirror quality plate, and provided with hinged panels for ventilation, these windows provide a combination of strength, service and utility in a very artistic form. At right: First class smoking room.

many others, all outside staterooms with beds, not berths, two outdoor built-in swimming pools, complete absence of vibration, private suites with private deck verandahs, electrical equipment for heating and cooling all parts of the ship and meeting the individual needs of passengers.

The Virginia is named after the state in which she was built, and, consistent with her American design and construction, the interior decoration and joiner work throughout are reminiscent of Virginia in the gracious colonial days. The interior architecture and decoration throughout the ship are for the most part American colonial as exemplified by fine old mansions and public buildings still existing along the Atlantic seaboard.

THE FIRST-CLASS LOUNGE

Three illustrations on this page give a very good idea of the lounge and its lobby. This room has a higher ceiling than that of the California and a more decorative and enlarged skylight, which, together with the removal of all pillars, gives it a very spacious appearance.

One of the attractive features is the effect of the large casement windows, especially designed for this room by the Kearfott Engineering Company of New York.

The decorations of the room are in the classical French style, the walls tinted with a soft shade of green, with decorative panels in fresco and moldings in a lighter tone.

Much of the decorative effect in the public rooms and staterooms on the Virginia is due to the adaptability of Vehisote for paneling work.

The lighting effects contribute in an effective way to the enrichment of the colorful interiors of the public rooms which vary so distinctly in their treatment. The lounge illuminated at night is quite different from the lounge in daylight. When darkness comes and the glow of electric illumination pervades the rooms, the day-time colors soften and change in tone, giving an effect strikingly different to the beauty of the room by day. The feeling of spaciousness which the impressive proportions of the lounge give one is greatly increased by the absence of pillars or any obstruction which would interfere with a long vista in either direction.

Lounge Shows French Influence

The lounge is a room about fifty feet square, in the center of which is a space kept clear at all times for dancing. Whenever occasion demands the covering of Saxony wool rugs may be taken up and the en-

tire floor given over to dancing. The general style of the lounge is classical French with attendant delicacy of design of cornices, panel mouldings, etc. The walls, tinted with a soft shade of green, have decorative panels in fresco and mouldings in a lighter tone. The ceiling centers in a large glass dome with concealed lights which intensify the soft indirect lighting from wall brackets and ceiling fixtures.

Over the four main entrance doors to this room are beautiful panels done in the Watteau style, depicting fountains, balustrades, and floral urns. On the forward bulkhead is a large mural which portrays tea time on the lawn before Washington's home at Mount Vernon. A splendid figure of America's first president is in the foreground greeting his guests. The furniture of the lounge reflects the French influence without following a distinct period. The sofas are done in old gold and crimson antique satin and the chairs in material to harmonize.

A fresh supply of air is provided by the large casement windows and the huge glass dome in the ceiling. In the lounge the naval architects have arranged a clear ceiling height of almost thirteen feet. This places the ceiling dome in splendid perspective and enables a very ornamental treatment of the windows. These casement windows were built especially for the ship by the Kearfott Engineering Company, with nickel silver casements and extruded bronze frames that harmonize beautifully with the decorative motif of this room. Ventilation is further augmented by fans concealed behind grills over the windows, each fan having an independent supply duct from the deck above. The furniture includes tables for bridgeand correspondence. This luxurious apartment, which is the center of social life aboard ship, has a stage curtained in crimson damask with trimmings of a golden tone which harmonize with the window draperies. The rear wall is completely covered by a beautiful curtain of golden damask. It is here that concerts and shows, which form such an important part of merrymaking at sea, are presented.

A de luxe stateroom featuring Simmons metal beds. All state rooms on the Virginia are equipped with Edison Hot Point surface mounted wall type electric heaters.

A Mellow Room

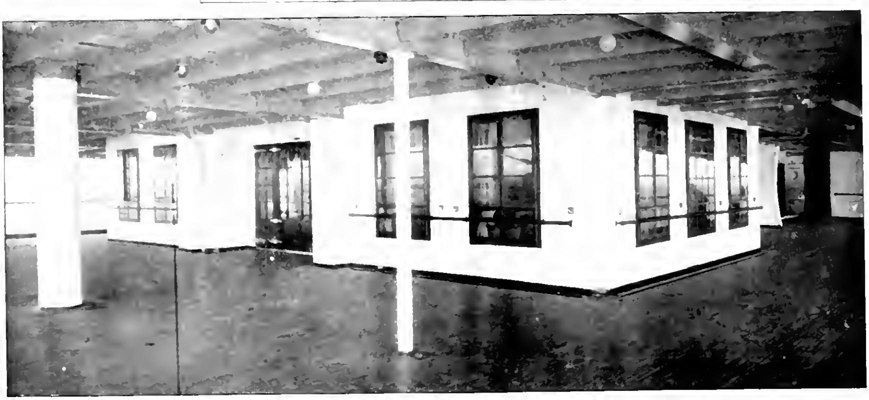
Passing aft through two attractive lobbies on either side of the lounge, one enters the first cabin smoking room, one of the most restful rooms ever designed for the sea. It is a notable example of early American decoration panelled in hard knotty pine skillfully aged to give antique effect and patterned after an interior in the Parson Capen house built in 1676 at Topsfield, Mass. Here the traveler may relax in a luxurious leather chair

A first class room with two beds and Pullman berth of Simmons manufacture.

First class stateroom with two Simmons beds.

Spacious Promenade Deck Spaces On Liner Virginia

A delightful feature of the liner Virginia is the spacious promenade deck, which is well illustrated by the three views on this page. The forward end of this deck is enclosed by storm window of the Kearfott type. All of the windows in the passenger accommodations on this deck were supplied by the Kearfott Engineering Company, casement type windows being used in the lounge and the verandah cafe and Unitypes in the library the foyers, and the smoking room.



and with little effort turn his imagination back to the days of the colonists. The stage is set for him. He is entirely surrounded by a perfect counterpart of an interior that was popular in America three hundred years ago. Glancing upward he sees the darkly glowing surfaces of the timbered ceiling. Before him is an early colonial mantel of wood; a cupboard; a stout table built for flagons of sack; and along the walls long hexagonal lanterns of brass and pewter which serve for lighting fixtures. From them comes a rich glow of soft electric light twenty times as powerful as the lone candle that lighted the originals carried by watchmen in the late seventeenth century.

Hung on the walls of this attractive lounging place are four historic portraits in oil by Mrs. Carola Spaeth, an artist of note in Philadelphia. They are excellent copies of early paintings of George Washington, Captain John Paul Jones, Stephen Decatur, and Commodore Perry. On the wall opposite the fireplace is a six-foot chart in oil by Stuart Travis, the cartographer, depicting the routes followed by the pirates in the Caribbean Sea. It is done in the same artistic fashion which Mr. Travis gave to the "Chart of the Coast from San Francisco to New York via the Panama Canal" which hangs on the wall of the foyer on C deck. It is a canvas four feet by seven and presents a wealth of historical data bringing to mind the glamorous days of Drake and the Golden Hind, Queen Elizabeth, Sir Walter Raleigh, Lord Delaware, Pocahontas, Captain John Smith, and other great figures of old Dominion history.

The tourist lounge features elegant and comfortable simplicity.

Virginia History Recalled

Among the pictures of note which were specially painted to adorn the walls of the Virginia is a mural in the aft entrance lobby, representing the arrival of Captain John Smith at Chesapeake Bay in 1607. Other paintings of interest represent historic places in Virginia. One of these is a picture of Bruton Parish Church on Sunday morning in Williamsburg, the town which is being restored to its condition in the days of the English governors through the generosity of an American philanthropist.

The Dining Saloon

The Virginia's dining room is perhaps the most striking example of the colonial style as applied to her public spaces. Its details of classic Georgian design are worked out in conjunction with a color scheme exceptionally light and cheerful. The paneling throughout is old ivory in tone. Overhead in the center is a large dome, the sides of which are fitted with mirrors in the form of windows, each having a painted brass balcony rail. The ports in the ship's sides are concealed by leaded glass casements over which hang draperies of glazed chintz in bright colors of flowers and fruits. Cuban mahogany serves as the framework for the chairs, which are upholstered in gray blue mohair.

Alternate squares of rubber tiling in grayish black and salmon and cream white have been used for covering the floor. Around them is a tile border of black and green. The room is exceptionally beautiful in daylight, but the real richness of the simple decoration is brought out most effectively at night by the carefully planned system of indirect lighting. A flood of soft light like the warm glow of a summer sunset comes from hidden lamps overhead and from fixtures in the shape of tall old silver candelabra resting in niches along the panelled walls. The dining tables are of various sizes to meet the requirements of individual groups of travellers.

Library in Cafe au Lait

Although the principal demand of travellers on this voyage between New York and San Francisco is abundance of opportunity for outdoor recreation, it has been observed that there are many travellers who at times enjoy a quiet retreat apart from the general centers of social activity. With this in mind the builders have equipped the Virginia with a library where seclusion of this sort may be had. It is a restful apartment with panelled walls and ceiling in tones of cafe au lait, and has been designed to have the charm and dignity of a private library ashore. The room is equipped with built-in book cases of antique design and has over-stuffed easy chairs and glass-top writing desks. The floor is entirely covered with a thick, soft carpet.

Another public room that will be of interest to travellers is the verandah cafe at the after end of the promenade deck. It has large casement windows and doors on the sides giving an unobstructed view of the sea. The verandah is a colorful room. Decorative wall panels, wicker chairs with upholstery in tones of antique gold and French blue, and jardiniers, filled with flowers, make a most attractive ensemble.

The same care and thought bestowed by the architects and decorators in the creation of beautiful public rooms have been given to the Virginia's foyers. The main entrance foyer of the first cabin on the upper, or C deck, forward of amidships is full-paneled in straight grain oak and comfortably furnished with large over-stuffed chairs and settees which make it a popular lounging place. The forward main stairway and adjoining lobbies also are done in oak, while those in the after part have a simple, painted finish with effective balustrades of painted brass.

(Continued on Page 13)

Propulsion Machinery of the Virginia

General Electric Company and Babcock & Wilcox Company Produce Efficient and Economical Power Plant for Safe and Vibrationless Propulsion of Huge Liner

By Frank V. Smith, Federal and Marine Dept., General Electric Company

HIGH-SPEED, modern transportation is still of the utmost commercial and competitive importance in the seeking of mail contracts, the dispatch of valuable cargo, and in catering to first-class passenger traffic, and means are now being sought to increase again the power and speed of ships.

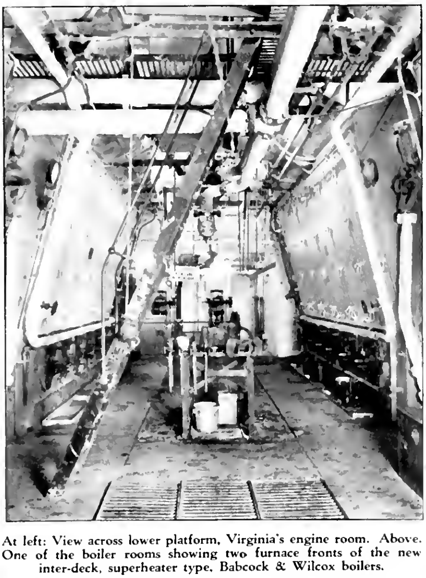
In 1913, United States naval engineers, in cooperation with W. R L. Emmet, consulting engineer of the General Electric Company, saw the tremendous advantage which electric propelling equipment would have for ships. Through their concerted efforts this type of propulsion was tried out on the collier Jupiter as an experiment. It was an unqualified success—so much so, in fact, that all of the later battleships were so equipped.

Our great background of electrical experience now stands us in good stead; we have a power in our hands which can be carried to any limit desired. Electric drive was installed on the airplane carriers Saratoga and Lexington, and, in a recent trial, the latter developed the unprecedented power of 210,000 horsepower at the propeller shafts; this amounts to 262 per cent of the greatest power ever applied on a North Atlantic liner and 131 per cent that which had ever been applied to a naval vessel of any type whatsoever.

Our merchant marine was slow to adopt this new form of drive, until in 1926 the International Mercantile Marine Company, with great vision into the future, decided to build three electric liners for its Panama Pacific Line. This company had the utmost confidence that such a project would stimulate trade between the east and west, and that the traveling public would give its unanimous support to ships that provided both speed and the ultimate in comfort to its passengers.

The steamship California was a brilliant success, and in its one year of service has become one of the most popular ships afloat. Its passenger accommodations have been booked ahead for as much as five months. Its economies ushered in a new era in ship propelling machinery which made it possible to give high speed service at reasonable rates. The fuel rate was but from 60 to 70 per cent of that existing on the large ships of the North Atlantic.

The eyes of Europe were turned westward, and the far-reaching effect of the California's performance can hardly yet be fully visualized. The Peninsular & Oriental Line contracted for the building of a similar ship for its India and Australia trade route; this ship, named the Viceroy of India, is now nearing completion, and will soon be placed in service. Lord Kylsant recently announced that the new 1000-foot passenger liner now being built by the White Star Line is to

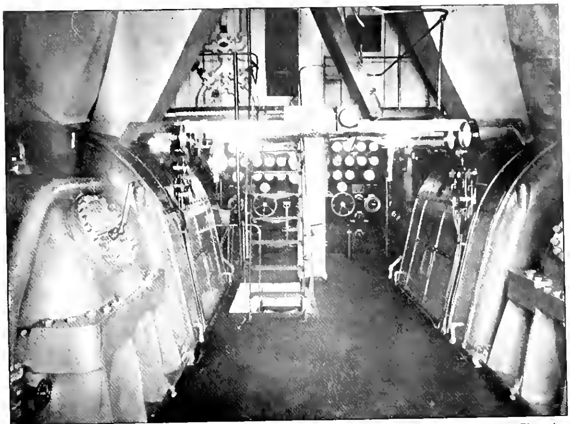


At left: View across lower platform, Virginia's engine room. Above. One of the boiler rooms showing two furnace fronts of the new inter-deck, superheater type, Babcock & Wilcox boilers.

be electrically driven. Other European lines are also thoroughly investigating the new possibilities which have been opened up because of the unlimited and economical power which can now be produced electrically on ships.

In this country we are undergoing a new awakening, and many new vessels are being projected. The Grace Line recently signed a contract for the building of a new all-electric passenger liner for its South American trade route, and other contracts are pending of equal importance.

The steamship California paved the way for the merchant marines of the world with its turbine-electric propelling equipment, and when the history of maritime development is finally written it will be considered as the one vessel responsible for the ushering in of the new era.



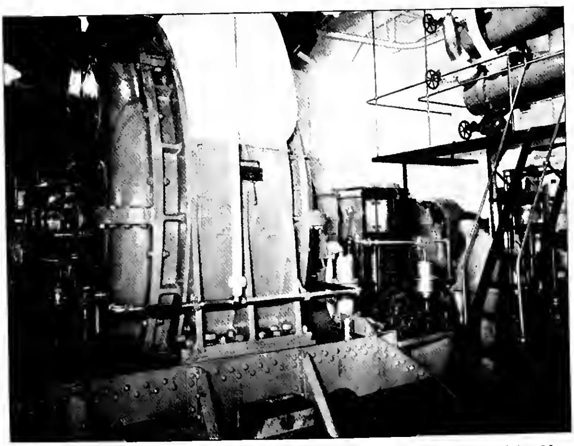
Operating platform of the Virginia's engine room, featuring the two General Electric turbo-generating sets and the main control panel.

The steamship Virginia, which has now taken her place alongside the California in the Panama-Pacific Line, is the second all-electric vessel to be completed; a third vessel is now being built which it is expected will be ready for commissioning about December 1929.

The Virginia, although almost an exact duplicate of the California in many ways, includes quite a number of new developments. She is slightly longer, being 613 feet long, whereas the California is 601 feet long. She has passenger accommodations for 800 in place of the California's 750.

Electricity has been provided throughout the ship wherever it can be used either to provide comfort or convenience for the passengers or to add to the economy or convenience of operation.

The Virginia has a different boiler arrangement from that of her sister ship, having eight of the new Babcock & Wilcox, inter-deck, superheater type boilers, in place of the twelve boilers on the California.



Close-up view of the port side General Electric propulsion motor of the Virginia. Note the De Laval lubricating oil purifier, lower right center.

Although the design and power of the propelling equipment on both vessels are the same, the Virginia has included a closed system of ventilation on both its generating and propelling motor equipment. This feature prevents any dust or oil vapor from being deposited on the windings, and follows the latest central station practice.

All the engine room auxiliaries, with the exception of the feed pump and a few pumps of minor capacity, are electrically driven. The engine room therefore has a very roomy appearance and is particularly free from steam lines. The major pumps, which operate in conjunction with the main propelling equipment and are motor driven, are all fitted with the latest type of automatic starting equipment. To start them it is only necessary to turn a small switch, much the same as one would turn an electric light on or off. Power for auxiliary purposes, such as excitation, motor ventilation, forced draft blowers, circulating and condensate pumps, refrigeration, lighting, etc., is furnished by four direct-current turbo-generating sets, each rated 500 kilowatts.

Of particular interest is the type of propelling equipment installed and the method of control. The main turbine generators, of which there are two, are very similar to those installed in any central sta-

PERFORMANCE DATA

VOYAGE Nº 2 — NEW YORK TO SAN FRANCISCO & RETURN — S S CALIFORNIA

	Bound	From Pilot Station to Pilot Station	1923 Date	Time Elaps Hrs Min	Distance by Observ N Mi	Speed K	P & S	Avg RPM	App Slip %	Motor Amps	Motor KW	Motor Loss KW	Motor SHP	Motor Eff %	Gen Amps	Gen KW	Gen Loss KW	Gen BHP	Gen Eff %	SHP/BHP	Field Loss Volts	Field Loss Amps Motor	Field Loss Amps Gen	Field Loss KW	Vent Loss KW	O A Eff %
1	WEST	NEW YORK TO HAVANA	3 10	69 36	1166		P	114 72		885	6060	109	7970		885	6060	159	8330			120	337	243			
			3 13				S	115 35		847	5982	107	7870		847	5982	160	8220			120	337	249			
						16 68	AVG	115 04	17 75	866				987	866				974	357	120					943
							TOTAL				12042	216	15841			12042	319	16550				674	492	140	45	
2	EAST	HAVANA TO NEW YORK	4 13	62 04	1172		P	115 16		875	6300	108	8290		875	6300	160	8650			120	349	255			
			4 16				S	115 69		871	6076	108	8000		871	6076	162	8350			120	343	254			
						18 58	AVG	115 42	6 45	873				983	873				975	958	120					944
							TOTAL				12376	216	16290			12376	322	17000				692	509	144	45	
3	WEST	HAVANA TO COLON	3 13	58 45	1003		P	111 7		807	5392	99	7100		807	5392	148	7280			120	328	240			
			3 16				S	112 6		786	5282	98	6940		786	5282	151	7430			120	325	240			
						17 07	AVG	112 2	13 1	796				982	796				973	955	120					940
							TOTAL				10674	197	14040			10674	299	14710				653	480	136	41	
4	EAST	COLON TO HAVANA	4 10	61 35	1007		P	105 38		711	4640	85	6100		711	4640	127	6380			120	330	244			
			4 13				S	105 45		715	4592	85	6040		715	4592	127	6320			120	329	249			
						16 35	AVG	105 4	14 3	713				982	713				973	955	120					938
							TOTAL				9232	170	12150			9232	254	12700				659	493	138	40	
5	WEST	BALBOA TO SAN DIEGO	3 16	162 19	2827		P	116 0		868	6136	108	8080		868	6136	166	8500			120	335	241			
			3 23				S	116 4		865	5914	108	7770		865	5914	160	8440			120	330	241			
						17 42	AVG	116 2	14 3	867				982	867				974	956	120					942
							TOTAL				12050	216	15850			12050	326	6590				665	488	138	45	
6	EAST	SAN PEDRO TO BALBOA	4 2	168 34	2907		P	112 4		815	5676	100	7470		815	5676	150	7810			120	336	247			
			4 9				S	112 6		808	5492	100	7230		808	5492	150	7510			120	334	244			
						17 13	AVG	112 5	13 0	812				982	812				974	956	120					941
							TOTAL				11168	200	14700			11168	300	15380				670	491	139	42	
7	WEST	SAN PEDRO TO FRISCO	3 25	19 13	353		P	118 7		950	6550	119	8620		950	6550	173	9010			120	346	250			
			3 26				S	120 0		950	6500	120	8550		950	6500	177	8950			120	348	247			
						18 35	AVG	119 3	12 5	950				982	950				974	956	120					943
							TOTAL				13050	239	17170			13050	350	17960				694	497	143	45	
8	EAST	FRISCO TO SAN PEDRO	3 31	19 09	353		P	117 5		912	6525	114	8590		912	6525	168	8970			120	350	255			
			4 1				S	118 5		912	6500	115	8560		912	6500	171	8940			120	350	250			
						18 43	AVG	118 0	10 3	912				982	912				975	957	120					944
							TOTAL				13025	229	17150			13025	339	17910				700	505	145	45	

tion ashore. They are of the downward exhaust type with the condensers mounted directly underneath. Each generator is rated 6600 kilowatts at 4000 volts, although on the trial trips they proved to have a very large overload capacity developing sufficient power to apply over 10,000 horsepower on one propeller shaft.

The propelling motors, which are directly connected to their respective propeller shafts, are what is known as the synchronous-induction type; that is, an induction motor squirrel-cage winding is imbedded in the pole pieces of the motor rotor for bringing the motor up to near synchronous speed before applying excitation to the rotor circuit. After excitation has been applied to the motor rotor circuit, the magnetic field set-up locks itself into synchronism with the revolving field of the armature circuit; as the rotor has no slip and no lines of force are being cut, the squirrel-cage winding automatically ceases to function.

Three main leads carry the current from the generator to the motor stator. To reverse the propelling motor requires but the altering of the position of two of these main leads and this is accomplished at the operating panel by means of what is known as the reversing lever.

When starting up an electric-drive equipment the turbine is operated at about one-quarter speed with the excitation cut off the main generator field circuit. When word is received from the bridge for either ahead or astern operation the reversing lever is moved to the position desired and the field lever is moved to the first position; as soon as the motor attains a steady speed the field lever is again moved forward, which applies excitation to the motor rotor circuit. The speed of the propeller is then raised or lowered as desired by altering the turbine speed. After the motor is in synchronism the turbine generator and motor are locked together magnetically at a definite speed reduction depending upon the number of poles in the motor, the same as if they were mechanically connected—except in this case the power is delivered across an air gap, something that will never show wear.

In reversing an electric ship the functions are performed very rapidly, for it is only necessary to take the field off of the generator, switch the connections by moving the reversing lever, and again to apply the field to the generator. As the turbine always rotates in one direction and never need be brought to a standstill while maneuvering, the inertia is quite small. Full power is available for backing as well as going ahead, and the turbine is reduced to its simplest and most fundamental design characteristics.

If desired, both propelling motors can be operated from one generator at a slightly reduced speed, which permits at the same time the shutting down of one condensing equipment with its attached auxiliaries. The percentage of speed that can be attained with one main generator only in operation is approximately 75.

On the Virginia the initial steam conditions are slightly higher than on the California; the boiler pressure is 300 pounds gauge, and the superheat 200 degrees Fahrenheit. The increased fuel economy as shown on the first run between Newport News and New York was approximately 10 per cent. as compared to that of the California.

The steamship California, the steamship Virginia, and the third vessel now being built give permanence to something worth while, and the potential trade possibilities between the east and west are being rapidly molded into a great dynamic force by the modern transportation which they afford.

PERFORMANCE DATA

VOYAGE Nº 2 — NEW YORK TO SAN FRANCISCO & RETURN — S S CALIFORNIA

	Bound	P & S	Running Time Hrs	Nº Blrs in Use	Steam at Boilers Press	Steam at Boilers Temp	Steam at Boilers Sup	Main Stm Press	Nozzles Open	Steam at H P Chest Press	Steam at H P Chest Temp	Steam at H P Chest Sup	Drop Boilers to H P Chest Press	Drop Temp	Drop Sup	H P 1st Stg Press	Bl. Condsr Stm Press	Exh Temp	Vac at Cond Ins*	Cooling Water Inj Temp	Cooling Water Disch Temp	Temp Rise °F	F W Tank Temp	Max Field 1st [Stg] Temp	Steam Displacement	Speed in Knots	Fuel # Tons SHP HR	Fuel # 100N	Fuel Tons Day
1	WEST	P						255	2122	251	503	97	19	7	0	83	½	96	28½		81	13							
		S						255	2122	253	501	95	17	8	2	83	5	94	28½		83	15		132					
		AVG	6395	10	270	510	97	255	2122	252	502	96	18	8	1	83	2½	95	28½	68	81	14	111	233	24100	16 68	886	779	14100	132 7
2	EAST	P						255	22	254	512	104	16	3	-2	91	1	98	28½		75	8		196					
		S						255	22	255	515	107	15	0	-5	89	3	93	28½		76	9		235					
		AVG	6208	10	270	516	102	255	22	254	513	105	16	2	-3	90	2	95	28½	67	75	8	115	194 / 234	24150	888	367	769	66300	134 1
3	WEST	P						255	1822	250	505	99	20	0	-7	75	0	95	28½		89	10							
		S						255	1822	250	498	92	20	7	0	77	6	98	28½		90	11		192					
		AVG	5815	10	270	505	92	255	1822	250	501	95	20	2	3	76	3	98	28½	79	89	10	120	235	24150	17 07	300	814	67000	122 9
4	EAST	P						255	18	230	429	100	40	10	4	64	2	93	28½		88	9		169					
		S						255	18	229	[illegible]	101	41	9	5	64	9	95	28½		88	9		235					
		AVG	6158	9	270	509	96	255	18	229	499	100	41	10	4	65	5½	97	28½	79	88	9	125	190 / 235	28100	16 55	266	795	5900	103 6
5	WEST	P						255	2226	254	5?1	103	16	0	5	88	1	99	28½		86	10							
		S						255	2223	255	505	97	15	6	1	88	5	97	28½		86	10		156					
		AVG	1623	10	270	511	98	255	2223	254	508	100	16	3	-2	88	3	98	28½	76	86	10	118	233	23150	17 42	887	781	71000	132 8
6	EAST	P			210			255	1822	253	501	94	17	5	-1	81	1	99	28½		86	10		135					
		S			210			255	1822	253	505	98	17	1	5	79	5	97	28½		87	11		235					
		AVG	1630	9 10	270	506	93	255	1822	253	508	96	17	3	-3	80	3	98	28½	76	86	10	120	155 / 234	24500	17 13	868	780	66980	128 0
7	WEST	P						255	22	253	521	114	17	-1	-7	89	1½	90	29		70	14							
		S						255	22	253	512	105	17	8	2	93	3	85	29		70	12		191					
		AVG	1922	10	265	520	107	256	22	253	516	109	17	4	2	91	2	87	29	56	70	14	105	230	23100	13 35	115	780	73000	148 4
8	EAST	P						255	22	254	513	106	16	4	-2	92	1½	92	28½		71	18		191					
		S						255	22	254	513	106	16	4	-2	93	3	88	29		72	19		229					
		AVG	1315	10	270	517	104	255	22	254	513	106	16	4	-2	92	2	90	28½	53	71	18	106	131 / 229	21400	18 43	115	784	72500	144 2

* VACUUM AT CONDENSER BY VACUUM GAUGE

A New Intercoastal Queen

(Continued from Page 9)

Suites with Private Deck

The Virginia can accommodate comfortably 400 cabin passengers in her all-outside staterooms. All rooms have metal beds with springs and hair mattresses. Accommodation for additional passengers is provided by sofa berths and folding Pullman "uppers." The furnishings are unusually attractive and give the rooms the cosiness of the home. The furniture is of special design in American maple and walnut, and the coverings which match the bed spreads are of charming two-toned prints, patterned after rare old Italian fabrics or gay toile de Jouy cretonnes. In some of the rooms two tones of green are used and in others crimson and tan. The large ports, or stateroom windows, are curtained in ecru mohair with narrow fringe to match the bed coverings. Many of these cabin accommodations are arranged en suite with private sitting rooms.

One of the novel features of the Virginia's cabin accommodations is the suites, which consist of bed rooms, private bath, sitting room, and private deck verandah. These luxurious homelike apartments will have a strong appeal to persons who desire seclusion on the journey. They can accommodate seven persons in two bedrooms having twin beds and a settee each, and one settee in the sitting room. The private verandah serves as a restful outdoor lounging place. The white pine deck is covered with colorful summer rugs over which are arranged tables and chairs of cane and wicker. Projecting from the deck above is a bright Spanish awning which protects occupants from the glare of the sun.

All rooms of these suites de luxe are specially decorated and furnished, the walls being relieved by small etchings and water colors in artistic frames.

Tourist Quarters Attractive

Like the staterooms of first cabin, the tourist rooms are all outside rooms and have hot and cold running water. They are airy, generous in size, and tastefully furnished.

The tourist public rooms, in their general style of architecture, conform with the first cabin public spaces though they are less elaborate in detail.

The tourist lounge, forty-two by forty-eight feet, is full-paneled in ivory tones and has small-patterned hangings of rose and white over leaded glass casement windows. The dining room is forty-eight feet square with paneled walls of soft tints and a dome of colonial design built into the center of the ceiling. The tables are arranged for two, four or eight persons, and service is from the same kitchens that serve the first class dining room. All lighting fixtures are in antique silver finish.

The quaint artistic interior design of the first cabin smoking room is represented in the corresponding apartment of the tourist cabin. The old pine paneling and antique hardware of the first class room are there, though worked out in more simple fashion.

The Virginia, although almost an exact duplicate of the California as regards physical appointments, will now hold the record of being the largest merchant vessel ever built in the United States. She is just 12 feet longer than the California.

A detailed description of propulsion and auxiliary machinery of the Virginia is given in a separate article in this issue.

These vessels, in addition to being propelled electrically, are supplied with such a wealth of electrical apparatus that the traveler today may enjoy the same comforts as those accorded in the finest hotels or in a person's own home. However, the passengers are not alone in receiving the benefits of the many electrical devices. The auxiliary equipment throughout the vessel is also electrified wherever possible, relieving to the greatest extent the drudgery and toil for the worker on the ship.

Quiet, Vibrationless Operation

The passengers who travel on these modern electric liners are going to be delighted with the mysterious, quiet, and vibrationless movement of the ship through tropical seas, the sight-seeing tours at Havana, Cuba, and Panama while enroute; they are also going to enjoy to the fullest extent the outdoor swimming pools, the morning and afternoon concerts, deck sports, gymnasium, dancing in the evening, and the verandah cafe. In a deeper sense, however, they are going to enjoy these things all the more because they know that the men who work on these vessels are sharing in the benefits which electricity has provided.

The California and Virginia, sister ships, now pave the way for a new era in ship construction that is in keeping with that modern and up-to-date American spirit—let machinery do the work.

Both vessels are a great credit to the Newport News Shipbuilding & Drydock Company, who built the vessels; to the General Electric Company, who powered the vessels; to the Babcock-Wilcox Company, who built the boilers; and to the International Mercantile Marine Company, whose far-sighted policy is so in keeping with our national ideals.

Virginia Carries Most Modern Equipment

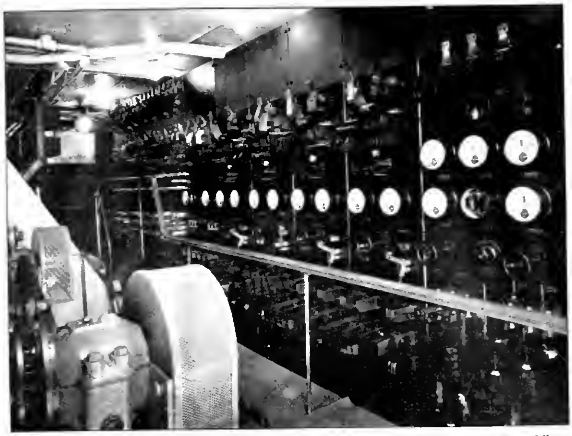
THE largest and finest passenger liner ever built in America docked at San Francisco, December 24, after a most successful run from the yard of her builders, The Newport News Shipbuilding & Dry Dock Company, to New York and thence on her maiden voyage to California. Named after the Old Dominion State, the Virginia is the very latest in naval architecture.

Propulsion power for her huge propellers is obtained from electric motors which receive their power from huge generators driven by high speed turbines. Even the compasses of this new wonder of the sea are electric. In addition to the old type magnetic compass, a neat, substantial looking machine called the Sperry gyro-compass, is housed down in the vessel's insides. A motor is employed to spin a gyro wheel at high speed in a special mounting. The gyro adjusts its spinning axis parallel to the earth's axis, which gives the true north and south without any interference from the ship's steel hull. Indicating compasses are mounted on the bridge and in any other part of the ship where a compass indication may be desirable.

The gyro-compass is also used to operate the Sperry gyro-pilot, or automatic steering equipment. When out on the high seas the Virginia will be guided accurately on her course by this machine, which is said to be far more accurate and efficient than the human quartermaster.

Auxiliaries and Equipment on Virginia

SUPPLEMENTING the articles on passenger accommodations and on propulsion machinery, we are here giving a description of the auxiliary machinery and equipment of the steamship California, as read by Rodger Williams, manager of the operating department, International Mercantile Marine Company, before the Thirty-sixth General Meeting of the American Society of Naval Architects and Marine Engineers on November 16 last at New York. The apparatus herein described was, we understand, duplicated on the steamship Virginia.



Switchboard for the control of lighting, heating, and auxiliary power circuits. 2000 kilowatts are distributed through this board at full capacity.

Deck and Floor Covering.—Selbalith magnesite deck covering is laid over the steel decks throughout the passenger and crew space. Rubber tiling, made by the United States Rubber Company, is laid over most of the public spaces in the passenger quarters, except in the carpeted library and the oak-floored first class lounge. Linoleum and rugs are used in the staterooms, hard tiling in the bathrooms, and in some places the Selbalith alone with hard surface suffices.

Galleys and Pantries—The galleys are electrically equipped throughout, except that there are two charcoal broilers. The ranges are Edison, 12 in number, including two in the crew's galley. There are two 180-loaf electric bake ovens, two Victor dishwashers, electric griddles, toasters, egg boilers, clean steam generators, and the usual jacketed kettles and other equipment for the preparation of food and care of equipment. The pantries are conveniently arranged and contain the usual equipment of steam tables, bains-marie, china and glassware lockers and coffee boilers.

Electric cooking has proved, in the service of the ship, to be entirely satisfactory and far more economical than anticipated.

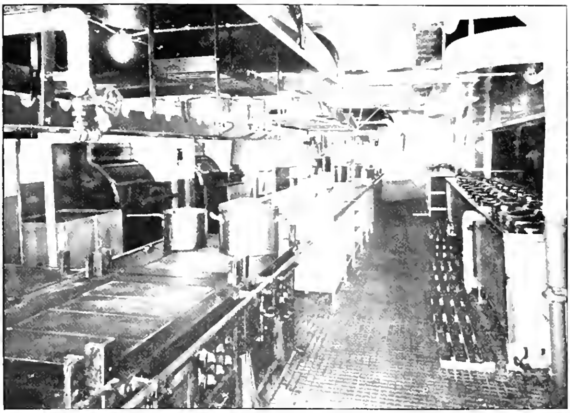
Life-Saving Equipment.—Welin davits and boats are arranged along the boat deck. The boats are metal on account of the tropical run. The equipment is in accordance with U.S. Steamboat Inspection rules. Electric winches are provided for hoisting, and there are two special emergency lifeboats fitted with the Vangunco hoisting and lowering gear.

Top of house on boat showing Sturtevant ventilating blowers driven by General Electric motors.

Hull and Cargo Machinery.—A Hyde steam windlass and a warping winch comprise the only steam hull machinery of importance. Steam was chosen for these purposes because it was found that the piping could be led through the pipe tunnel conveniently and therefore it was possible to take advantage of the cheaper cost of equipment and to guard, as well, against the difficulties of using electrical machinery in spaces so exposed to salt water. All other hull and cargo machinery is motor driven.

The steering gear is of the Hyde hydro-electric type, such as is used on some of the newer battleships. The control from the bridge is by two separate systems, one of which is by telemotor, and the second, electric, which is used in conjunction with the Sperry automatic steering. The steering gear is designed to allow the rudder to be turned through an angle of 70 degrees in thirty seconds at a ship speed of 18 knots.

There are three Hyde electric-



First class galley on steamship Virginia featuring Edison electric cooking appliances and ranges.

ally driven, nonreversible capstans for handling heavy lines, designed to exert a pull of 25,000 pounds at a speed of 50 feet per minute and capable of speed up to 125 pounds per minute at lighter loads.

The electric winches for cargo handling consist of sixteen Lidgerwood single-geared, high-speed winches and two Shephard high-speed winches on the weather decks; eight double-geared, medium-speed winches between decks. The high-speed winches will lift 1500 pounds at a speed of 300 feet per minute. Heavier loads lessen the speed, but our experience with the ship in six months has shown that the choice of winches has been amply justified both for handling average cargo as well as for heavier general cargo. The Shepard winches were installed largely for test purposes, as they contain several advantageous features for marine work and so far have functioned well. The 'tween deck winches have been satisfactory. They operate through swinging cranes, which method of handling cargo from blind hatches is reasonably satisfactory when used in conjunction with towing trucks and trailers.

Access to the 'tween deck hatches is provided through large side doors, hinged, in pairs, or single, each door being 7 feet 4 inches in height by 4 feet 6 inches in width. Doors are also provided for the fuel oil connections, for embarking passengers, and for handling engine and victualling stores, making a total of twenty-four side ports in the ship. The doors are guttered inside and scuppered and have given no trouble.

Water-tight doors are electrically operated throughout and controlled through a centralized panel in the wheelhouse. The system operates on the direct-current system and also by the emergency lighting and power sets.

The navigating equipment comprises the Sperry gyroscopic compass system and automatic steering; a Brown telemotor; stand-by magnetic compasses; a Kolster radio direction finder; motor-driven sounding machines; submarine signal set; a course recorder; revolution indicators; and other useful instruments. Two 1000-watt Sperry searchlights are placed on top of the bridge.

Ventilation. — Mechanical and natural ventilation is provided. The mechanical ventilation is motor-driven, supply and exhaust, the fans being located on the boat deckhouses. Air is forced into the staterooms, public spaces, fire rooms, engine rooms, and crew's quarters, and is exhausted from toilets, baths, smoking rooms, and galleys. Natural ventilation through cowls is provided for cargo spaces and certain other parts of the ship.

Fire Protection. — The boiler rooms have the Foamite system. The Rich system is provided for detecting fires in the holds and other inaccessible places with the control cabinet in the wheel-house. A steam smothering system is provided for the holds. Throughout passenger spaces, storerooms, and other spaces is installed the Cory electric-pneumatic system for giving the alarm. Fire screen bulkheads and fire doors are located in the passenger spaces. The usual equipment of portable extinguishers and fire hydrants is provided.

Interior Communication.—A tele-

(Continued on Page 30)

First class pantry equipment on the Virginia, featuring electrical short order equipment and steam table.

Trade, Traffic, and Shipping

Commercial Aviation in the United States

Twenty-fifth Anniversary of Orville Wright's First Flight Witnesses Tremendous Progress in Aerial Transportation

WHEN Orville Wright made his historic flight twenty-five years ago, commercial aviation was a dream. Scoffers ridiculed the prediction that some day mail, express, and passengers would be transported in "a flying machine." The types of skeptics who sat on the river banks expecting to see Fulton's steamboat blow up and the types which declared the steam train "because it goes more than 15 miles an hour is a device of Satan," were in evidence twenty-five years ago. Professor Langley, whose plane crashed just three months before the Wright brothers' flight, died broken hearted only to receive honors in another decade.

To many the Wright brothers were "queer fellows." Their first flights came when "horseless carriages" wee frightening the countryside and the public was even debating the practicability of the automobile, just as it has always debated every new form of transportation since the day when the caveman hitched the family cow to a cart and humans for the first time got their feet off the ground.

The following figures, compiled by the American Air Transport Association, answer the scoffer of less than a generation ago.

Expressed statistically, the status of commercial aviation in America today is:

Miles being flown daily by mail, express, and passenger planes on regular scheduled routes	40,654
Miles of airways	14,833
Miles of airways operating or scheduled	20,326
Miles of mail airways	12,397
Miles of lighted airways	8,000
Miles flown daily with mail	30,000
Number of states traversed by commercial air lines	37
Number of cities served by planes on regular schedules	108
Population of areas surrounding cities served by mail and express and passenger planes	60,000,000
*Air Mail carried in 1928, tons	1,700
*Letters carried in 1928	137,000,000
*Express Shipments carried in 1928	30,000

*Estimated.

Planes of commercial aviation companies in the United States fly more miles than those of any other nation; also more miles at night. Figures on total transport mileage flown in 1927 were:

United States	6,000,000	France	3,500,000
Germany	5,500,000	British Empire	2,000,000

In 1927, airplane miles flown in transportation operations in the United States increased 1,700,000 over 1926. In 1928, they will register a minimum increase of 4,000,000 miles over 1927.

This record is outstanding because this country's splendid networks of air mail and transport lines are operating without subsidy from the central government. France, in 1928, allowed 218,174,140 francs for civil aviation of which 115,000,000 francs is for premiums and subsidies. The British Government in the past seven years spent 1,382,780 pounds in certain direct aids to subsidize air and transport lines. In recent years the British government has paid one company 137,000 pounds annually as a direct subsidy for operating between Great Britain and the Continent. This company received another subsidy for its services between England and Egypt. Germany appropriated 19,750,000 marks in 1928.

McCormick Official Reports Growth in Trade

PRESIDENT-ELECT HOOVER'S visit to South America will result in great and immediate commercial benefits to the United States, perhaps even twenty-five per cent within a year, according to Ralph W. Bybee, manager of the foreign department for the McCormick Steamship Company, after a trip on his company's steamer West Camargo around South America, which consumed four months and sent him in trade investigations through seven countries.

"Nowhere does trade follow friendship as among the Latin-American states," Bybee said, "and a lot of foreign-provoked suspicions are going to be allayed by Mr. Hoover."

Brazilians are anticipating Mr. Hoover's visit with mixed emotions, he declared. They have arbitrary price regulations on coffee, and, having seen what Mr. Hoover did to the British rubber monopoly, they are wondering where the "big stick" will fall next. Bybee said the Brazil Coffee Institute has a 12,000,000 bag surplus of coffee in warehouses, and the largest crop in history is expected in 1929, the disposal and financing of which is troubling them in view of aggressive marketing by neighbor states, now developing plantations of the beverage beans.

Argentina and Brazil, particularly, are making forward strides in commercial fields. Buenos Aires is completing 28 additional berths for shipping, yet these will not entirely alleviate the cramped conditions, so

(Continued on Page 41, Blue Section)

An American Freighter in the Orient

Some Remarks on Cargo Handling Methods in Transpacific Ports as Seen Through the Eyes of a Layman

By Fred B. Michelson

A PROMINENT San Francisco steamship executive recently said "The ordinary freight carrying vessel plying between Pacific Coast ports and China, Japan, and the Philippines loses approximately $2500 on each voyage due to antiquated methods of handling cargo on the other side of the Pacific." This amount, he explained, is lost through delay in the ship's turn-around, which naturally translates itself into extra dollars paid out in wages, keep, and up-keep, as well as into loss of many days on the yearly schedule.

One need not be a steamship man to recognize the truth of that statement, provided he makes a trip to the Orient on a freighter, Such a trip was made recently by the writer on an American (Shipping Board built) freighter operated by a Pacific Coast shipping company from Pacific Coast ports to ports in Japan, China and the Philippines.

Taking the ports visited in the order in which they came on our itinerary, Nagoya, Japan, is first. There are too few docking facilities at Nagoya, despite the fact that it is the third or fourth largest city in Japan. Consequently our ship anchored in the stream. Cargo for this port consisted principally of lumber, which was carried on deck, and a few logs, which were carried in the after hold. The lumber and logs both were unloaded into the water, where native stevedores made them into rafts. Probably the only loss of time came about through the slow rate of speed with which the Japanese stevedore works.

At Hakata we again anchored in the stream. More lumber was discharged and a small parcel of cargo was taken aboard for Chinese ports. However small the parcel was we were in Hakata more than two days.

A sunset in the Philippines looking through coconut palms from whence comes copra, one of the principal products of the islands.

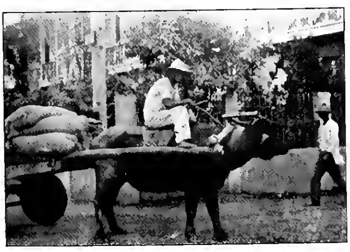
One inevitable factor which delays operations is the failure of stevedores to speak English, or the failure of Americans to speak Japanese, whichever way the blame should fall. One of the difficulties arising out of this situation came about in Hakata, when a swinging stick of lumber struck a cargo light and demolished it. There was much gabbling and gesticulating before one of the coolies was sent to find the quartermaster. The quartermaster happened to be on the forecastle head putting up the anchor light, and could not be located for fifteen or twenty minutes. Even after he was singled out the coolie failed to make his wants clear until by gesture and gurgles he had enticed the quartermaster to the after well deck. There the stevedore boss explained that he wanted another "look lamp" to light the progress of his labor. So the repartee between the ship's crew and the coolies went on—with hands and feet and a great amount of guessing on both sides.

Time, the sages say, waits for no man. And the Oriental coolie is just as indifferent toward time. Receiving only a few "clackers" for his day's work, it is little wonder that his conscience does not worry under the memory of a wasted hour. But an hour, or two or three, in unloading a ship sometimes means the difference of a day in the ship's schedule.

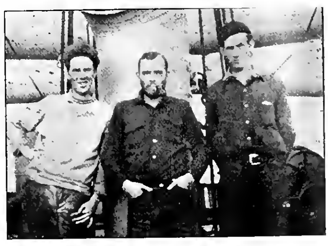
Having spent Christmas Day in Hakata, we triced up her booms and set sail for Shanghai. We were already five days behind schedule, four of them lost at sea due to heavy weather and head winds, and the other one somehow lost in Nagoya and Hakata.

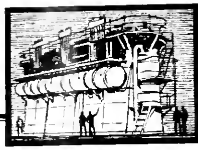
It was mid-afternoon of the day before New Year when we steamed up the Yangtze Poo river. Multitudinous and multi-formed craft swarmed on the broad, yellow stream. There were warships and merchant ships, submarine tenders and airplane carriers anchored to the buoys in two solid lines along either side of the river. Junks, sampans, gun boats, and fertilizer boats swarmed in and out and across the channel. Shanghai being an inter-

(Continued on Page 45, Blue Section)



Left: A Filipino and his caribou transporting sugar to the docks. Right: Three quartermasters on an American freighter.





In the Engine Room

Modern Steam Generation Afloat

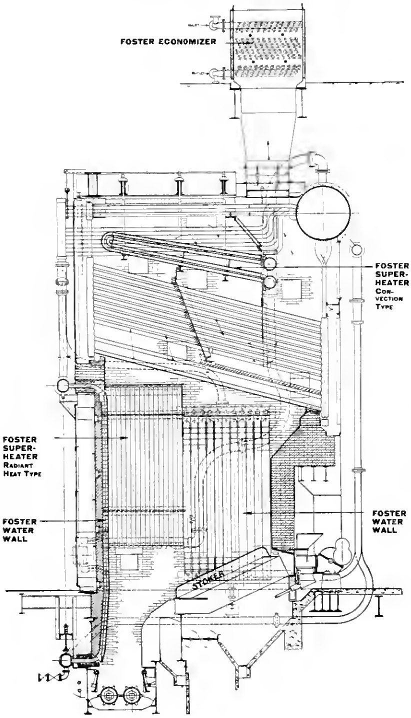
Designers of Marine Boilers Should Apply the Recent Developments in Shore Practice

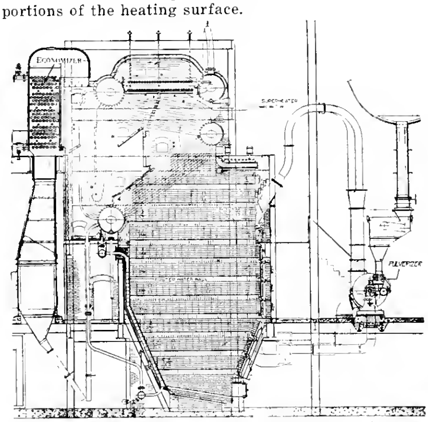
THE passage of the Jones-White bill having revived interest in shipbuilding, the question naturally arises as to what extent marine steam generation can be improved through adopting the improvements established in land power plants.

The boiler, as we have commonly termed the apparatus used for steam generation, is composed of two parts having exactly opposite functions; first, a furnace designed to withstand high temperatures and in which fuel is burned to produce heat; second, a cooling furnace which acts as a refrigerator in cooling the furnace and the hot gases of combustion. This is usually called boiler heating surface and has heretofore performed two entirely separate and distinct functions; namely, it first supplied the sensible heat necessary to raise the feed water to the temperature of evaporation and it then added the latent heat required for evaporation at the desired pressure.

In designing this boiler heating surface for marine use the following points are of major importance:

1. The form that the surface shall take.
2. The arrangement that will give largest steam capacity with minimum weight.
3. The absorption of the maximum amount of radiant heat by the water heating surface.
4. The largest possible water reserve.
5. The desirability of separating the surface used to supply sensible heat from that used to supply latent heat.
6. The precipitation of the scale forming solids present in feed water in a section of the boiler not exposed to intense heat.
7. Provision for rapid circulation over the hottest portions of the heating surface.





Two typical examples of industrial practice in water-tube boiler design.

At left, 1276-horsepower, 450-pound pressure Babcock & Wilcox boiler fitted with superheater, economizer, and water walls, and arranged for mechanical stoking.

Above. 1035-horsepower Kidwell boiler arranged for pulverized coal and equipped with superheater, economizer, and combination air-cooled refractory and water walls.

It is theoretically possible to design an ideal boiler But can the requirements of efficiency be met with a construction that will be easy to repair, cheap to maintain, and reliable under long voyages?

The tendency in modern steam generator design is to separate the total heating surface into the following divisions:

1. Furnace walls and floor.
2. Heating surface for adding sensible heat.
3. Heating surface for adding latent heat.
4. Heating surface for adding superheat.
5. Heating surface for air preheating.

The Furnace

The furnace is now recognized as the most important part of the steam generator or boiler. The steam producing capacity is determined by the quantities of fuel which can be effectively burned in the furnace. The efficiency is also largely affected by the furnace, as inefficient combustion will reduce the heat absorbed by the best design of heating surface.

It is very interesting to note the trend of furnace design ashore. Furnace dimensions have been increased greatly and the trend is toward complete water cooling of furnaces. Large furnace dimensions result in a relatively small B.T.U. release per cubic foot of furnace volume with attendant low furnace maintenance. Of equal importance is the efficient combustion of fuel and mixing of the gases before entering the water heating surface which results from the large furnace. It is well known that high boiler efficiency is dependent upon high carbon dioxide because of the smaller amount of excess air used. With small furnaces it is necessary to use more excess air in order to bring each particle of fuel into intimate contact with sufficient oxygen due to the shorter space of time available for combustion.

Water cooling of furnaces was at first used with the idea of decreasing brickwork maintenance; but the land engineer has since found that with it he is able to obtain higher efficiencies from less heating surface because of the large radiant heat absorption by such furnace walls. The application of complete water cooling will render the marine water-tube furnace similar to the Scotch boiler furnace insofar as the elimination of brickwork and other furnace troubles is concerned. Water walls replace furnace brickwork, thereby reducing the area of incandescent radiating surface. Water walls lower furnace temperatures through the absorption of radiant heat and assist in the work formerly done by the lower rows of boiler tubes, thereby decreasing tube troubles. As space limitations aboard ship do not permit as large a furnace as is considered best practice ashore, the use of water walls is even more imperative in a marine furnace as they offset to a large extent this loss of furnace volume.

TABLE I.—TABULATIONS SHOWING PERCENTAGE OF HEAT ABSORPTION BY VARIOUS PORTIONS OF BOILER HEATING SURFACE *

Heating Surface passed over		Temperature		Steam Generated				
Sq. ft.	Percent	Total	Drop	Lbs. per hour	Total lbs.	Per-cent	Total Per-cent	Per sq. ft. per hr.
	0	2500						
305	10	1870	630	4880		32	32	16
610	20	1430	440	3050	7930	20	52	10
915	30	1140	290	2287	10217	15	67	7.5
1220	40	950	190	1673	11895	11	78	5.5
1525	50	810	140	1067	12962	7	85	3.5
1830	60	700	110	763	13725	5	90	2.5
2135	70	620	80	533	14258	3½	93½	1.75
2440	80	565	55	382	14640	2½	96	1.25
2745	90	525	40	305	14965	2	98	1.00
3050	100	500	25	305	15250	2	100	1.00

* These determinations were made by the U. S. Bureau of Mines on a 3050-square-foot Foster marine boiler.

Addition of Sensible Heat

In the past it has been customary to heat the feed water to approximately 200 degrees by means of a feed water heater and then depend upon the boiler to supply the remainder of the sensible heat in addition to the latent heat required to convert it to steam. Best efficiencies can be obtained by supplying practically all of this sensible heat before introducing the water to the evaporating section of the boiler.

There are two ways of obtaining this sensible heat. One is through the use of stage bleeding for feed water heating and the other is by the combination of a low pressure feed water heater and an economizer recovering heat from boiler exit gases.

Data compiled by the United States Bureau of Mines show the gas temperature drop through a straight-tube, cross-drum, marine boiler. It establishes the fact that the last 40 per cent of the boiler surface performs only 6 per cent of the work, and that the first 10 per cent does 30 to 40 per cent of the work.

Until recently this last 40 per cent of relatively inefficient surface has been retained because it seemed the only practical means of reducing stack gases to a reasonable temperature. The present trend in shore and modern marine installations is toward the elimination of this last 40 per cent of the boiler surface and the substitution therefor of a surface designed to effect efficient heat transfer from low temperature gases. Contraflow marine economizers have accomplished this very satisfactorily.

On the other hand, stage-bleeding feed heating must be considered, as the efficiency of steam turbines is increased by the use of such feed-water heaters; their application makes it possible to raise the feed temperature to 300 degrees or better. The employment of such equipment would partially eliminate the usefulness of the economizer as the sensible heat would be supplied by bled steam. In its place there would be a much smaller economizer and air heater or an air heater of great size (due to the comparatively low rate of heat

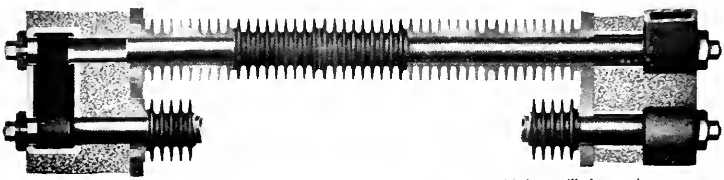


Fig. 1. Sectional view of marine type economizer. Straight steel tubes with iron, gill ring castings shrunk on and having their ends connected by forged steel headers. This gill ring construction presents six times more heat absorbing surface per lineal foot than would the bare steel tubing.

transfer in an air heater), if the maximum efficiency is to be obtained.

Troubles were experienced through rapid stack-gas corrosion and internal exidation of economizers in the early installations afloat and ashore. These difficulties have been overcome and there are now available reliable contraflow marine economizers which will give corrosion and internal oxidation of economizers in the satisfactory service. A study of the performance records, for many years, of a large number of economizer installations, now operating both in stationary and marine plants, will settle any doubt on this point.

The efficiency of an economizer has always been recognized and many simple devices have been tried in the past but failed because of the above mentioned troubles. In the economizers now used external corrosion has been overcome by an extended cast iron surface which is shrunk on to steel tubes. All exposed surfaces are of cast iron and all pressure surfaces are of steel tubing or forged steel headers—an ideal combination for marine economizer service. Through the use of the extended heating surface it is possible to keep the area to carry the water small and the velocity of the water correspondingly high, thereby also eliminating internal oxidation. The design is such that the water and gas pass on opposite sides of this surface in counter current flow. This arrangement gives the most effective use of the heating surface thereby reducing weight and bulk. The contraflow principle, so ideal for maximum heat transfer from lower temperature gases, is used in the economizers, but is impossible to obtain in the evaporating section. There are, at the present time, marine installations in operation in which economizers of similar type have been used and from which the exit-gas temperatures have been maintained in regular daily service well below 300 degrees, while the feed-water temperature, leaving the economizer and entering the boiler, was considerably above 300 degrees.

The economizer affects the double advantage of preheating feed water to the required temperature and of reducing the higher boiler exit-gas temperatures. It would appear, therefore, that some combination of steam-bleeding heaters with economizers would present the ideal means of preheating the feed water and reducing boiler exit-gas temperatures.

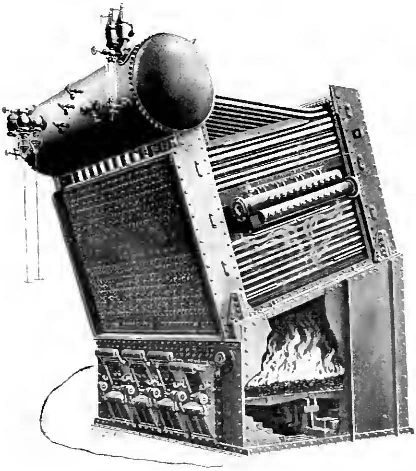
Evaporating Surface

The evaporation section of the boiler or steam generator should be so designed as to present the maximum possible area to the radiant heat of the furnace. The circulation of water should be so arranged as to precipitate the scale-forming solids before the water enters the tubes exposed to the furnace. Tubes should be large enough for thorough mechanical cleaning. The general design should provide reliability, high capacity, and means for making all repairs in the shortest possible time.

One of the main advantages of the Scotch boiler over the water-tube boiler in the past has been its greater water storage capacity. In the design of a new boiler ample water reserve should be provided for.

Superheaters

Modern practice has demonstrated the important gains which result from high superheat and at the present time the only desirable limit to superheat is the temperature above which materials fail. To obtain this superheat it is essential to use heating surface of a design and material suitable to withstand the temperature to which it will be subjected. Supports should be arranged so as to prevent bending or warping of elements. The superheater should be so installed as to permit of successful and frequent external cleaning by steam jets. All joints and pipe connections to the superheater should be available from the fire room in order that it may be possible, in case of emergency at sea, to cut out individual elements with minimum delay and without cooling the boiler. This eliminates the necessity for by-passing the superheater, if a leak should develop—by-passing is undesirable as it may damage the entire superheater.



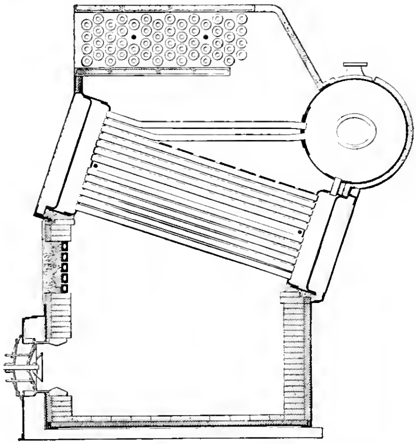


Fig. 2. Typical cross drum, straight tube, marine water-tube boilers. The illustration at left shows this type of boiler as constructed for American ships during the war period. ..At right is shown the present type with increased furnace volume, radiant heat superheater in front wall.and economizer at the top.

Air Preheaters

For certain fuels such as pulverized coal or coal fired by stoker, a certain amount of preheated air is generally advocated but there is a temperature beyond which the gain in efficiency from preheating air for combustion falls off rapidly. In using preheated air in a marine furnace care must be exercised, as marine furnace temperatures are already far in excess of what is considered best practice. Any material increase in the furnace temperatures will increase both furnace and boiler maintenance.

It appears that with present marine design the preheating of air approximately 100 degrees fahrenheit is all that is desirable for use with oil fuel and most pulverized coal or stoker-fired installations. This preheating will give most of the possible gain in combustion efficiency without approaching a point detrimental to furnace walls and tubes exposed to radiant heat.

Development

These conditions have been met ashore. The boiler proper, which in the past was the greater portion of the total installation, has shrunk to relatively small importance in the complete modern steam generator. The furnace occupies more space than the evaporating surface.

The first move towards efficient steam generation, based upon the principles outlined, was the cross drum straight tube steam generator, shown in Fig. 2. It has been installed in a number of steamers and is built in two types—a stay-bolted header for moderate pressures and a vertical wrought-steel sectional header for higher pressures. The furnaces are being fired by oil, coal hand-fired, and by stokers.

The drawing shows a radiant heat superheater in the front furnace wall above the oil burners, this being the simplest form of marine superheater for this type of boiler, having all connections, handhole, plates, and headers outside of the boiler casing. This superheater has the advantage of giving practically constant superheat at all required ratings. It replaces a part of the brickwork and cools the furnace by absorbing radiant heat.

Through the use of the economizer and radiant superheater it will be noted that it has been possible to obtain a comparatively large furnace volume in the restricted head room available aboard ship.

Type "A" Bent-Tube Marine Steam Generator

An entirely different arrangement of boiler heating surfaces to give additional and better-formed furnace volume with more radiant heat absorbing surface is given in Fig. 3. This shows the desirability of the bent-tube compared with the straight-tube, cross-drum boiler for marine work. The water reserve of this boiler is greater than that of the customary straight-tube, cross-drum marine boiler of the same heating surface. The "A" type of boiler lends itself to water walls of simple construction and minimum cost. The water walls and inclined tube-banks present two large black surfaces opposed to the three radiating surfaces in the furnace. The rear wall can also be water-cooled, if desirable.

Economizer

The economizer sections are designed to raise the feed-water temperature from about 200 degrees to over 300 degrees, or close to the evaporation temperature. The economizer exit gases will be 300 degrees fahrenheit or less; a much lower temperature than that obtained on the marine boilers of the past except the marine steam generators above referred to. The temperature of the water leaving the economizer is high enough to precipitate most of the solids in the economizer, where they will do the least damage and where they do not become as hard as in the hotter parts of the boiler.

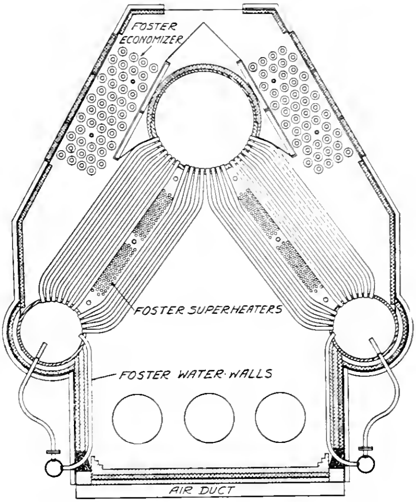


Fig. 3. Capital A type, bent-tube, marine steam generator fitted with economizer, superheaters, and water walls, with air duct under furnace floor.

Evaporating Surface

The evaporating surface of this "A" boiler is of a type familiar to marine men. It was developed principally for what is known as express service where extremely light weight with maximum possible steaming capacity and ruggedness were demanded. In the past this type of boiler has generally been built with small tubes which made internal cleaning very difficult. The arrangement of tubes made it necessary to replace numerous tubes whenever a tube in one of the inner banks had to be renewed. The use of the larger tubes, shown in Fig. 3, eliminates the cleaning difficulties and the tube spacing is arranged with alternate wide and narrow spaces permitting the removal of any tube with maximum ease and without removing any other. The replacement of boiler tubes with this arrangement will be much easier than in the cross-drum type of boiler, as anyone who has attempted to pull an encrusted tube through a tube sheet will know.

Circulation and Precipitation of Solids

The water of this boiler will pass down through the rear rows coming to rest temporarily in the lower drum before rising up through the furnace rows of tubes. The precipitation of any solids which have not been deposited in the economizer will take place, largely, in the rear rows of tubes and lower boiler drums. Solids which collect in the lower drums are prevented from entering the water-wall tubes by the long removable drum nipples.

The inclination of the tube bank permits of a much better and more rapid circulation of water, thus eliminating the frequent bowing of tubes which is experi-

(Continued on Page 47, Blue Section)

With The Naval Architects and Marine Engineers

IN the December Pacific Marine Review, we printed short abstracts of the six papers read during the first day of the annual meeting of the American Society of Naval Architects and Marine Engineers, held November 15 and 16 at New York. These papers were largely concerned with design and structural problems relating to ship hulls. On the second day, the papers dealt largely with the propulsion plants of ships, and we here present abstracts of these covering several angles of marine engineering progress.

Development of Pulverized Fuel for Marine Purposes During 1927-1928, by Carl J. Jefferson, Commander Joseph S. Evans, U.S.N., and Commander Joseph Broshek, U.S.N.

Results of tests on the steamships Mercer, Lingan, and Stuart Star are given, those on the Mercer in considerable detail. Mercer is the United States Shipping Board experimental conversion job; Lingan is a conversion by the Dominion Coal Company (Canadian); and Stuart Star is a partial conversion by British owners. Summarizing the results to date, the authors state that:

"The reliability and safety of pulverized fuel have been thoroughly demonstrated by actual sea operation of the three seagoing installations cited, also by the performance of the towboat Illinois, which has been in operation approximately eighteen months on the Mississippi River.

The ability to use satisfactorily fuels which could not be used otherwise in a Scotch marine boiler has likewise been definitely demonstrated.

The economic possibilities have been indicated, and the problem in relation to adapting pulverized fuel to marine practice has been crystallized.

Real definite progress has been accomplished. However, the final standard type of installation still needs to be worked out.

Conversions and new installations now being made will further the development of the art and aid towards transforming it from an art into a fixed science having definite laws that can be employed with confidence by marine engineers."

Shore tests data from recent developments are given in considerable detail. The new Todd system, which provides a completely pulverized blower and burner for each furnace shows very favorable results.

The authors conclude that:

"The possibility of efficient, reliable and safe operation of marine boilers with pulverized fuel is no longer a hypothesis. It is an established fact demonstrated by actual operation both under test plant and sea service conditions.

The impression that pulverized fuel has entirely passed out of the experimental stage, however, must be avoided, for such is not the case.

For some of the marine trade routes pulverized fuel can, in its present state of development, be adopted with every assurance of satisfactory results, but in others the application must still be considered an experiment.

Service tests of the various available low grade bunker fuels are required to determine their economic merits.

There are certain basic facts regarding pulverized fuel which should be determined, the establishment of which can best be handled by a research rather than a development program. The main items that require such treatment are:

(a) The pulverized fuel carrying capacity of air under varying temperatures, humidity and velocity conditions for the varying degrees of fineness of the fuel;

(b) The establishment of a standard method of determining "grindability" of various fuels;

(c) A survey of the various bunker fuels of the world to determine their grindability.

The determination of these basic facts is of such vital importance to the development of the art that the research program should be sponsored by all the allied interests connected with the production, preparation, and consumption of solid fuels. These include fuel producers, distributors, manufacturers of equipment, shipowners, and operators."

The Burning of Hydro-Carbons under Marine Boilers, by Ernest H. Peabody.

A paper on the burning of oil fuel and pulverized coal. After summarizing the development of oil burning, the author assumes an average freight vessel with Scotch marine boilers and shows that with complete combustion in the corrugated furnace, the B.T.U. release per cubic foot (furnace only) is approximately 80,000, and total combustion space is approximately 36,000 per hour. This higher rate is only one-third of the actual rate in naval service under forced conditions. Pulverized coal must meet this same condition to be a practical competitor with oil fuel. Oil sprays are discussed in connection with photographic studies.

Considerable space is devoted to the discussion of the question: "How fine must the coal be ground in order to obtain satisfactory combustion in the Scotch boiler? This is at present a highly speculative question, not to say a controversial one. It would seem that the theorem already stated—that it is an economic loss to carry the grinding process farther than actually required to obtain complete combustion—will be generally accepted. But that is merely putting the question in another form.

The idea that there is required for proper combustion in Scotch boiler furnaces a large percentage of 'superfines' (meaning perhaps particles which will pass a 300-mesh screen) is a natural one, unless we stop to think of power consumption. 'Superfines' undoubtedly assist ignition, but there was never any difficulty in obtaining proper ignition with the impact mill at Philadelphia under conditions where the coal samples showed but little more than 50 per cent passing the 200-mesh screen.

Others have suggested, and the writer believes, that more important than the presence of the superfines is the absence of the coarser particles. Powdered coal, all of which would pass a 40-mesh screen, would undoubtedly give excellent results even if very little of it passed the 300-mesh screen."

A system suggested by H. B. Pearson, Jr., of Bethlehem Steel Company is commended. In this system a Bethlehem roller pulverizer "delivers the pulverized fuel into what Mr. Pearson calls a 'unit bin,' which holds enough fuel for about one watch. Suitable screw feeders (one for each burner) in the bottom of this

hopper feed the coal into the pipes leading to each furnace, and the carrier air picks up this coal and delivers it direct to the burners. This proposed system is flexible; the piping is simplified and special 'distributors' are eliminated; the pulverizer is in operation only part of a watch, and then at maximum economy as to power consumption per ton of fuel; any combination of burners may be used at will and the system is ideal for use in port. No danger of spontaneous combustion exists because the coal remains in this hopper a short time only.

In closing, the author again begs to offer the suggestion that low cost in preparing pulverized coal, delivering it to the burners, and removing the ash from the boiler flues are the crucial points on which depend the future success of the use of pulverized coal at sea in competition with oil."

Forced Blast Chain Grate Stoker Tests of a Marine Water-Tube Boiler. By T. B. Stillman.

This "paper is devoted to a description of tests run with a forced blast chain grate stoker installed under a boiler at the Bayonne Works of the Babcock & Wilcox Company. The object of conducting the tests was to develop methods for satisfactorily and efficiently utilizing coal as a fuel under marine water tube boilers, without requiring the heavy manual labor involved in hand firing."

The test results are tabulated in full and lead the author to conclude that:

"1. With a properly designed and installed forced blast chain grate stoker, a wide variety of coal may be burned efficiently in the relatively small furnace volumes normally available under marine water-tube boilers.

2. The power required to operate the stoker will average less than one horsepower per boiler, a trifling increase in the auxiliary load of the ship.

3. Approximately 10 per cent saving in the fuel consumption of the ship may be expected from the use of these stokers, compared to average hand-fired practice.

4. In maneuvering a ship, the flexibility of a forced blast chain grate stoker installation is the same as that to be expected from hand firing.

5. The disposal of the ashes in a forced blast chain grate installation is a relatively simple matter and, by the use of suitable equipment, may be accomplished with no manual labor.

6. Taking account of the reduction in personnel due to the use of the stokers, as well as the increase in boiler efficiency, there results an increased 'overall efficiency' of the ship which represents an appreciable saving in the cost of ship operation as compared with hand firing. The percentage of this saving increases with the number of boilers, due to the greater reduction in fire room personnel. Even where there is no great reduction in personnel, the relatively light labor involved in operating stokers will be an important factor in inducing good men to remain with a ship so equipped."

Turbine Electric Drive as Applied on the Great Lakes Cargo Ships. By C. R. Fisher, electrical engineer, Bradley Transportation Company, and A. Kennedy, Federal and Marine Department, General Electric Company.

Discusses general trend of ship design on Great Lakes and refers in particular to the turbo-electric steamers T. W. Robinson and Carl D. Bradley, giving complete test data for the latter. The authors summarize as follows:

The turbine electric drive on the T. W. Robinson and Carl D. Bradley have proved adaptable in maneuvering and general operation on the Great Lakes.

The low cost of maintenance of turbine electric drive on a Great Lakes cargo ship can only be proved by time, but based on ships operated at sea it is less than a reciprocating steam engine.

The automatic stokers allow the use of slacked coal, with a 20 per cent saving in the cost of fuel, and on the Carl D. Bradley have eliminated six firemen.

The Carl D. Bradley requires between 1.15 and 1.2 lbs. of coal per shaft horsepower hour for all purposes when running under a constant steaming condition against 1.65 to 2.25 lbs. per shaft horsepower hour for the reciprocating steam engine as operated on the Great Lakes. The over-all coal consumption for thirty trips in 1927 on the Carl D. Bradley, which is a self-unloader, including all coal used when loading, unloading, delayed, etc., was 1.39 pounds per shaft horsepower. This is equivalent on a cost basis, using slacked coal, to .47 pound of diesel oil per shaft horsepower for all purposes, including all fuel used loading, unloading, delayed, under way, etc.

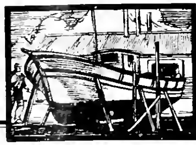
The average gross ton-miles per pound of coal as fired for thirty trips in 1927 was 32.2.

The average gross ton-miles per pound of coal as fired up to September, 1928, is 32.58."

Description and Trials of Steamship California, by Roger Williams. A very nicely illustrated description of the fine turbo-electric Panama-Pacific liner California and details of her performance data. A part of the description is used as the text of an article on the auxiliaries of her sister ship the Virginia on another page in this issue. The tabular statement of the performance of the California is reproduced in the article on the propulsion machinery of the Virginia.

Performance of the converted Motorships for the United States Shipping Board, by Captain R. D. Gatewood. This paper is a supplement to the paper describing these installations and the results obtained on the thirty-day trials of their main propulsion units, as read by Captain Gatewood in the meeting last year. The captain now presents the actual results of a year's operating service at sea. The figures for the twelve ships cover 46,941 total sea hours with only 408 hours total detention, considerable of which is attributable to steering engine trouble and other auxiliaries. With the exception of some trouble with the cooling systems, the diesels have shown very satisfactory results. Of the twenty-six voyages covered, three were to Europe, four to the East Coast of South America, eight to the Far East, and eleven round-the-world, making a total mileage of 545,852. The results are all tabulated on plates accompanying the paper.

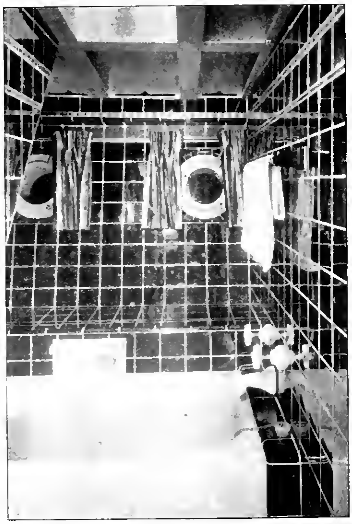
Central Power Plant Goes to Sea, by Commander O. B. Newman, U.S.C.G. The author of this paper was responsible for introducing turbo-electric propulsion machinery into Coast Guard cutters. This paper deals with the trials of the turbo-electric Coast Guard cutter Pontchartrain. The Pontchartrain has all electric motor driven auxiliaries, and uses steam at 245 pounds per square inch and 672 degrees Fahrenheit. Her propulsion machinery and all of the electrical equipment were designed by the Westinghouse Electric and Manufacturing Company. The plant approximates central station practice ashore in that all auxiliary power may be taken from the main generator.



Workboats and Their Power Plants

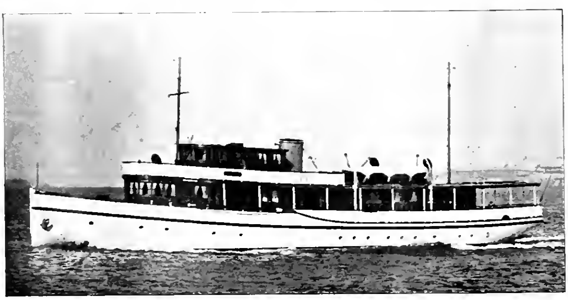
The Yacht Norab

Largest and Finest Cruising Yacht Built in San Diego



THE Campbell Machine Company of San Diego recently finished for Baron Long of San Diego a 110-foot diesel yacht which contains many features of finish, decoration and construction that are very unusual in wooden vessels of this size. She has a beam of 23 feet, draft of 8 feet 6 inches, is built of Oregon pine throughout, with two steel water-tight bulkheads forming the engine room amidships. Her keel is a 16 x 18 inch, full length timber. The keelson is 18 by 20 inch, molded, and the planking is $2\frac{1}{4}$ inch net thickness of clear, vertical grain, Oregone pine. The decking is 3 inch teak. All finish in the way of staterooms and quarters is oak or mahogany trim with Haskelite mahogany three-ply panels.

Under the deck the space aft of the engine room is divided into five double guest compartments, with private lavatory in each compartment, two shower baths, and one tub bath. Forward of the engine room, below deck, is located the crew's quarters, with accommodations for four men, including lavatory and shower bath. Above the deck there are two long deck houses separated by a 3-foot companionway. At the forward end of the forward deck house the dining room, 12 feet by 20 feet, is finished in oak. It has a seating capacity of 20 guests, and is furnished as shown in the illustration. A large galley finished in tile and furnished with a Rock-Gas cooking range and all the latest modern equipment gives the impression of a modern apartment house kitchen. Aft of the companionway is located the owner's stateroom and bath, and aft of this stateroom is the main saloon, 14 by 20 feet, finished in early English oak style.



One of the features of this yacht, as will be noted in the illustrations, is the complete tiling of the bathroom and the kitchen. Southern California seems to be leading the world in the matter of finishing ship bath rooms. We shall be very interested to see how this tiling holds up on a wooden vessel in heavy weather. We congratulate M. Madruga of the Campbell Machine Company, designer of this yacht, for his courage in working out these beautiful interiors in this material.

The main power plant on the Norab is a 300-horsepower, 8-cylinder, fully reversible Union diesel engine, built by the Union Diesel Engine Company of Oakland, California, and and equipped with pilot house control. This engine drives a 60-inch 3-bladed Columbian wheel, giving the yacht a speed of approximately 13 miles an hour.

A 15-kilowatt generator is operated from the main engine and a $7\frac{1}{2}$-kilowatt Universal generating set is installed for additional light and power. A large Edison storage battery unit provides light at night and power for the radio. For fire protection, a full automatic CO2 system has been installed below deck and ample provision of hand extinguishers and salt water hose lines is made above deck. An American Engineering Company type

G-4, self-containe . electric windlass and two American Engineering Company Type D self-contained electric hoists furnish power for handling anchors and boats.

In all of the cabins and quarters below deck, fresh air is brought down through the partitions from the ceiling of the deck house entering the lower cabins through small openings in the compartment trim at the ceiling. An electrically driven suction fan in the engine room draws the air from the floor of each of these compartments, so that with all port holes closed there is a complete change of air in all under deck compartments every few minutes.

A MODERN APARTMENT AFLOAT

The interiors of the palatial yacht Norab, built by the Campbell Machine Company of San Diego for Baron Long, in their equipment and finish resemble the modern apartment ashore. This is well shown in the three illustrations on this page and in the picture of the guests' bath room on the facing page. The upper illustration shows the dining room with seating capacity for twenty. The central illustration shows the main lounge, which is equipped with first class radio receiving set and furnished lavishly with overstuffed chairs and davenports. The lower illustration shows the kitchen, which evidently was not designed by any sea cook. Both the kitchen and the bathroom shown are finished throughout in tiled walls.

A Year of Progress

Lloyd's Register of Shipping.—Report of the Society's Operations during the year 1927-1928.

The report is a summary of the company's business during the fiscal year mentioned, and shows that an increase in volume was enjoyed due to two causes; first, the completion of much tonnage in British yards which was delayed due to the coal strike during the period 1926-1927; second, the increased demand for oil tankers.

The report is very interesting in that it portrays in a very brief manner the world-wide development in types of ships and their propulsion equipment, brought out by the types the Society is called upon to survey and register.

The California Tuna Fleet

Part III.—Details of the Fleet

By O. H. Barnhill

IN the first two installments of this series of articles, we have described in a general way a few of the outstanding tuna fishing boats working out of Los Angeles harbor, and have pointed out some of the methods of construction peculiar to this type of boat and some of the outstanding factors necessary for successful tuna fishing.

We here present two lists of these fishing boats. First, a list of the outstanding, recently built, larger boats on which we were able to get fairly full particulars. Second, a list of some of the other boats of the fleet segregated according to the make of diesel engine used. None of the boats listed in the first list appears in the second.

So far as we have been able to check it, the information contained in these lists is substantially correct. We would, however, be very glad to have it checked by the boat owners themselves, the engine manufacturers, and others interested, to the end that the list may be corrected and republished in later issues. All hulls are wood except where otherwise stated.

ORIENT

Owner: Theodora and Sousa. **Builder and Designer:** Los Angeles Shipbuilding & Drydock Corp. **Size:** 112 x 25 x 12 feet. Steel hull. **Cost:** not stated. **Speed:** 10¾ knots. **Capacity:** 150 tons iced fish. **Crew:** 12 men. **Power:** one 350-H.P. Atlas-Imperial diesel and one 27-H.P. Atlas-Imperial diesel. **Refrigerator:** one 4-ton York. **Insulation:** Fish holds lined with 7-inch cork. **Fishes for:** San Diego Packing Company.

POINT LOMA

Owner: M. Perry and K. Hovden Co. **Builder:** San Diego Marine Construction Co. **Designer:** Ray L. Prewett. **Size:** 96 x 23 x 10 feet. **Cost:** $55,000. **Speed:** 11 knots. **Capacity:** 115 tons. **Power:** One 300-H.P. Atlas-Imperial diesel and two 40-H.P. Continental gas engines. **Capacity:** 115 tons of iced fish. **Crew:** 12 men. **Refrigerator:** 5-ton Lipman. **Cork insulation,** 3 and 4 inches. **Fishes for:** K. Hovden Co.

LUSITANIA

Owner: Manuel Rosa. **Builder and designer:** Al Larson. **Size:** 99 x 22 x 9 feet. **Cost:** $55,000. **Speed:** 9 to 11 knots. **Capacity:** 120 tons. **Power:** 300-H.P. Western-Enterprise diesel and two Continental gas engines. **Berths** for 12 men. **Insulation:** 2 inches of corkboard. **Fishes for:** Westgate Packing Co.

WESTERN ENTERPRISE

Owner: Y. Nakasuji. **Builder and designer:** Al Larson. **Size:** 86 x 17 x 9 feet. **Cost:** $40,000. **Berths** for 10 men. **Power:** 200-H.P. Western-Enterprise diesel, Chevrolet and Ford motors. **Refrigerator:** 2-ton Lipman. **Insulation:** 2 inches of corkboard.

ENTERPRISE

Owners: George Chiba and Co. **Builder and designer:** Al Larson. **Size:** 98 x 19 x 10 feet. **Cost:** $50,000. **Power:** 250 Western-Enterprise diesel. **Berths** for 10 men. **Refrigerator:** —. **Insulation:** 2 ins. of corkboard.

TAIYO

Owners: Seki & Sakamoto. **Size:** 112 x 25 x 11 feet. **Cost:** $65,000. **Builder and designer:** Al Larson. **Power:** 375 H.P. Western Enterprise diesel, 45-H.P. Western-Enterprise diesel, and 10-H.P. Novo engine. **Berths** for 15 men. **Refrigerator:** 5-ton York. **Insulation:** 3 and 4 inches of cork. **Fishes for:** California Packing Co.

MARINER

Owner: Joe and Matthew Monise. **Builder:** Campbell Machine Co. **Designer:** Manuel Madruga. **Size:** 115 x 25 x 11 feet. **Cost:** $68,500. **Speed:** 10 to 12 knots. **Capacity:** 150 tons of iced fish. **Power:** 350-H.P. Union diesel and 35-H.P. Union diesel. **Crew:** 10 men. **Refrigerator:** 5-ton York. **Insulation:** Fish holds lined with 4 inches cork. **Fishes for:** Van Camp Sea Food Co.

EMMA R. S.

Owner: Guy H. Silva. **Builder:** San Diego Marine Construction Co. **Designer:** Ray L. Prewett. **Size:** 95 x 23 x 10. **Cost:** $55,000. **Speed:** 10 to 12 knots. **Capacity:** 110 tons iced fish. **Power:** 400-H.P. Fairbanks-Morse diesel and 27-H.P. Fairbanks-Morse diesel generating set. **Crew:** 10 men. **Refrigerator:** 5-ton Lipman. **Insulation:** Fish holds lined with 4 inches of cork. **Fishes for:** Van Camp.

GLORY OF THE SEAS

Owners: M. Correia and Ernest Montiero. **Builder:** Delano Brusstar. **Designer:** Edwin B. Shock. **Size:** 117 x 26 feet. **Cost:** $75,000. **Speed:** 10 to 12 knots. **Capacity:** 200 tons iced fish. **Power:** 400-H.P. Union diesel and 35-H.P. Union diesel. **Crew:** 11 men. **Refrigerator:** 6-ton York. **Insulation:** Fish holds lined with 4 inches of cork. **Fishes for** Van Camp.

SACRAMENTO

Owners: John Santos and M. Sousa. **Builder and designer:** Al Larson. **Size:** 115 x 25 x 11 feet. **Cost:** $67,500. **Speed:** 10 to 12 knots. **Capacity:** 150 tons iced fish. **Power:** 400-H.P. Fairbanks-Morse diesel and two 20-H.P. Continental gas engines. **Crew:** 10 men; berths for 15. **Refrigerator:** 5-ton Vilter. **Insulation:** Fish holds lined with 4 inches of cork. **Fishes for:** Van Camp.

ADVENTURER

Owner: August Felando. **Builder and designer:** John Rados. **Size:** 115 x 26 x 9 feet. **Cost:** $70,000. **Speed:** 11 to 12 knots. **Capacity:** 150 tons iced fish. **Power:** 300 H.P. Union diesel and 35-H.P. Union diesel. **Crew:** 10 men. **Refrigerator:** 8-ton York. **Insulation:** fish holds lined with 3 inches of cork. **Fishes for** Van Camp.

PATRIOTIC

Owner: Y. Ryono. **Builder and designer:** John Rados. **Size**· 81 x 21 feet. **Cost:** $40,000. **Speed:** 10 to 12 knots. **Capacity:** 60 tons of iced fish. **Power:** 210-H.P. Fairbanks-Morse diesel and Continental gas engine. **Crew:** 8 men. **Type:** combination hook-and-line and purse seine. **Fishes for** Van Camp.

FUNCHAL

Owners: M. F. and M. S. Correia. **Builders:** Nunes Brothers. **Designer:** M. I. Nunes. **Size:** 115 x 25 x 10 feet. **Cost:** $65,000. **Speed:** 10 to 12 knots. **Capacity:** 150 tons of iced fish. **Power:** 350-H.P. and 30-H.P. Atlas-Imperial diesel engines. **Crew:** 10 men. **Refrigerator:** 8-ton Lipman. **Insulation:** fish holds lined with 4 inches of cork. **Fishes** for Van Camp.

GREYHOUND

Owner: J. M. Medina & Sons. **Builder:** Nunes Brothers. **Designer:** M. I. Nunes. **Size:** 115 x 25 feet. **Cost:** $67,500. **Speed:** 11 to 13 knots. **Capacity:** 135 tons of iced fish. **Power:** 450-H.P. and 30-H.P. Western-Enterprise diesels. **Crew:** 10 men. **Refrigerator:** 5-ton York. **Insulation:** fish holds lined with 4 inches of cork. **Fishes for** Van Camp.

FLYING CLOUD

Owners: Yamaguchi & Tomeido. **Builder:** Delano Brusstar. **Designer:** Edson B. Schock. **Size:** 105 feet length. **Cost:** $60,000. **Speed:** 11 knots. **Capacity:** 140 tons. **Berths** for 13 men. **Power:** 360-H.P. Fairbanks-Morse diesel. **Refrigerator:** 8-ton Lipman. Cork **insulation:** fish holds and bait wells cork lined. **Operates** for Westgate Packing.

ABRAHAM LINCOLN

Owner: ————. **Builder:** Campbell Machine Co. **Size:** 82 feet length. **Cost:** $32,000. **Speed:** 10 knots. **Capacity:** 65 tons. **Berths** for 8 men. **Powered** with 150-H.P. Union diesel. **Insulated** with cork. Fishes for Westgate Packing Co.

CONTI VERDE

Owner: A. Castignola. **Builder:** Al Larson. **Size:** 78 feet length. **Cost:** $32,000. **Capacity:** 70 tons iced fish. **Power:** 180-H.P. Western - Enterprise diesel. **Crew:** 8 men. Insulated with cork.

Southern California Tuna Fishing Fleet

(Seggregated According to Make of Diesel Engine Used)

WESTERN-ENTERPRISE

A. Hashimoto, **Ubuyu;** 180 H.P.

Frank Silva. **St. Therese;** Cohn-Hopkins; 108 x 23 x 10; $60,000; 375 H.P.; Peter Rask, builder.

Joaquin Medina. **Van Camp;** 115 x 23 x 10; $65,000; 375 H.P.

Tony Cordich. **Jugo Slavijia;** 80 x 19 x 10; 160 H.P.

Pete Demorio. **Alecksander;** French Sardine Co.; 80 x 18; 160 H.P.; Harbor Boat Works, designer and builder.

Fred Schilling. **Betty B;** 70 x 18; 80 H.P.

Steve Malkovich. **California No. 2;** 70 x 18; 110 H.P.; Al Larson, designer and builder.

V. Karmelich. **Gallant;** 80 x 20; 180 H.P.; L. A. Shipyard.

Tom Creese. **Gallico;** 60 x 16; 65 H.P.

Justo Pesutich. **Humanity;** 65 x 16; 110 H.P.

C. D. Lang. **Intrepid;** 110 x 18; 110 H.P.

Morgan Brothers. **Morgan;** 110 x 18; 110 H.P.

Geo. Kobayashi. **Nisshin;** 98 x 19 x 10; 250 H.P.; Al Larson.

Coast Fishing Co. **Orion;** 70 x 15; 110 H.P.

Manuel Silva. **San Gabriel;** 65 x 16; 110 H.P.; Robbins Boat Works.

Peter Dragish. **Sea Rider;** 76 x 20; 160 H.P.; Los Angeles Shipbuilding & Drydock Co.

Stafford Packing Co. **Stella;** S. P. Co.; 70 x 18; 110 H.P.; Al Larson.

H. Kizu. **Success No. 3;** Los Angeles Seafood Packing Co.; 70 x 18; 110 H.P.

S. Oka. **Sweet No. 2;** 65 x 16; 80 H.P.

A. Hashimoto. **Ubuyu Maru No. 2;** Cohn-Hopkins Co.; 70 x 18; 135 H.P.; Al Larson.

John Benson. **Uncle Sam;** Cohn-Hopkins; 70 x 18; 135 H.P.; Al Larson.

Not stated. **Westmaco;** Van Camp; 65 x 15; 90 H.P.

Matsuki & Sugiyama. **Southern Cross;** Coast Fishing Co.; 118 x 26; 450 H.P.; Delano Brusstar.

UNION DIESELS

Fred Canapa. **Stella di Genova;** Cohn-Hopkins; 112 x 25 x 10; $65,000; 300 H.P.; Peter Rask, designer and builder.

M. George. **Shina No. 2;** San Diego Packing Co.; 65 x 14; $21,000; 75 H.P.; Campbell Machine Co., builder; Manuel Madruga, designer.

M. Crivello. **Oceana;** Cohn-Hopkins; 65 x 14; $24,000; 90 H.P.; Campbell Machine Works, builder; Manuel Madruga, designer.

M. Tavares. **Supreme;** San Diego Packing Co.; 65 x 14; $21,000; 75 H.P.; Campbell Machine Works, builder; Manuel Madruga, designer.

J. Zolezzi. **Balboa;** 80 x 18; $34,000; 100 H.P.; Campbell Machine Co., builder; Manuel Madruga, designer.

Victor & Manuel Goularte. **San Joaquin;** Van Camp; 78 x 17; $32,000; 150 H.P.; Campbell Machine Co., builder; Manuel Madruga, designer.

John Canapa. **Princess;** 55 x 11; $15,000; 55 H.P.; Campbell Machine Co., builder; Manuel Madruga, designer.

Ocean Industries Co. **Kazuyo;** California Packing; 58 x 10; $15,000; 55 H.P.; Campbell Machine Co., builder; Manuel Madruga, designer.

Frank Alioto. **Miss America;** California Packing; 58 x 10; $15,000; 55 H.P.; Campbell Machine Works, builder; Manuel Madruga, designer.

Joe M. Medina. **Olympia;** Van Camp; 95 x 18; $45,000; 225 H.P.; Campbell Machine Works, builder; Manuel Madruga, designer.

Manuel Freitas. **Del Monte;** California Packing; 95 x 18; $45,000; 225 H.P.; Campbell Machine Works, builder; Manuel Madruga, designer.

John Cardoza. **St. Veronica;** California Packing; 115 x 25 x 8; $65,000; 300 H.P.; Campbell Machine Works, builder; Manuel Madruga, designer.

M. Silviera. **California;** California Packing; 115 x 25 x 8; $65,000; 300 H.P.; Campbell Machine Works, builder; Manuel Madruga, designer.

M. O. Medina. **Atlantic;** 110 x 23 x 6; 300 H.P.; Campbell Machine Works, builder; Manual Madruga, designer.

FAIRBANKS-MORSE DIESELS

Wm. Maggio. **Hermoso;** 150 x 26 x 11; 520 H.P.

E. Caginola. **Contra Costa;** Westgate Packing Co.; 78 H.P.; $26,000; 360 H.P.; Al Larson.

Santos & Sousa. **Van Camp;** 110 feet; $55,000; 360 H.P.; Al Larson.

A. Ryono. **Van Camp;** 80 feet; $35,000; 215 H.P.; Harbor Boatbuilding.

Guy Silva. **Lois S.;** 75 feet; 120 H.P.

WORTHINGTON DIESEL

Patricia Corporation. **Patricia;** 90 x 22; $60,000; 240 H.P.

ATLAS-IMPERIAL DIESELS

M. Crivello. **G. Marconi;** Cohn-Hopkins; 83 feet; $35,000; Peter Rask; 200 H.P.

Nick Dragich; 80 x 20 x 10; Peter Rask; 200 H.P.

Sam Felipe & Bompenserro. **Milwaukee;** 75 x 18 x 6; Peter Rask; 125 H.P.

Allen. **A. B. Carpenter;** 118 x 24 x 11; 350 H.P.

M. Luz. **Hawk I.;** 66 x 17 x 8; Garbutt & Walsh; 110 H.P.

Matt Zovich. **Gloria R.;** 75 x 17 x 8; 125 H.P.

N. Ardito. **N. Ardito;** 60 x 15 x 7; 75 H.P.

John Mezich. **Ambassador;** 62 x 16 x 7; 100 H.P.

Martinovich & Garbelija. **Vitality;** 84 x 20 x 8; 200 H.P.

Stanovich & Holata. **Louise Ray;** 70 x 18 x 10; $80,000; Los Angeles Shipbuilding Corp.; 350 H.P.

WASHINGTON ESTEP DIESELS

John Gabelich. **Marie Joan;** 78 x 19 x 8; J. M. Martinac; 180 H.P.

Dick Suryan. **Lindbergh;** 73 x 18 x 9; Lake Washington Shipyards; 180 H.P.

T. Inouye, **New Monterey;** Calif. Packing; 80 x 19 x 9; Al Larson; 180 H.P.

Jerry Acalin. **Acalin;** 77 x 19 x 7; 180 H.P.

A. Kordich. **Oregon;** 66 x 17 x 4; Western Boat Building Co.; 90 H.P.

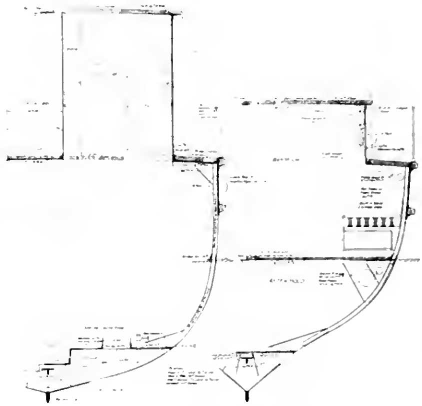
New Survey Tender for Coast Survey

UNITED STATES Coast and Geodetic Survey has recently placed with the Albina Marine Iron Works, Portland, Oregon, contract for building a steel diesel-driven tender for service in Alaskan waters. The principal dimensions of this boat are:

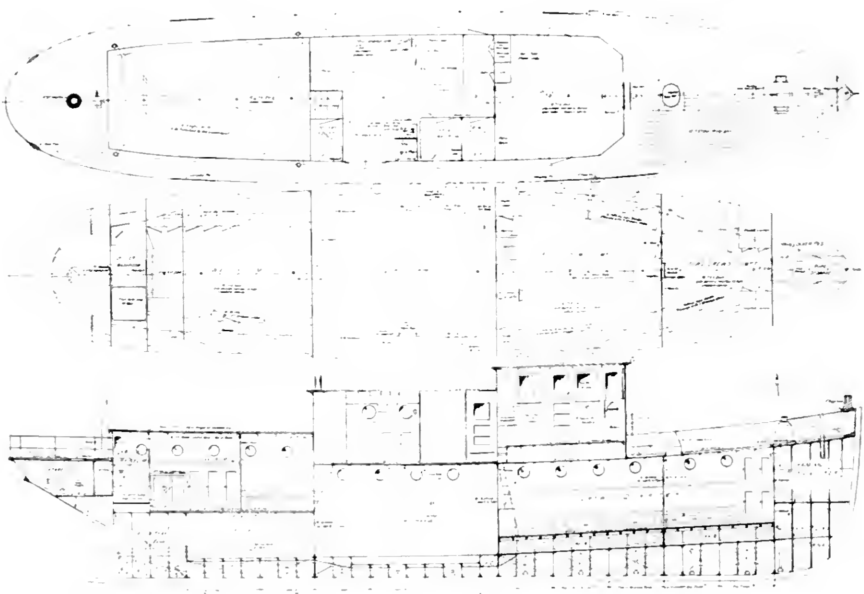
Length over-all	77'6"
Length between perpendiculars	66'6"
Beam, molded	15'6"
Depth, molded	10'3"
Displacement at 6ft. mean draft,	tons 90

The midship section plans and inboard profile, reproduced herewith, give a very good idea of the construction of this steel boat. She has double bottoms throughout, five water-tight bulkheads, and is very staunchly framed so as to insure safety in the dangerous navigation along the Alaska Coast. Large fuel oil, fresh water, and provision storage is provided; so that this boat can be used as an independent unit in exposed regions.

Propulsion will be with a directly reversible full diesel engine capable of delivering 140 horsepower and connected to the propeller shaft through a throw-out clutch. This clutch is for disconnecting the engine while warming up in cold weather. Auxiliary power and light will be provided by a 5-kilowatt and a 2-kilowatt automatic gasoline engine driven generators. The cooling water from these generator engines will be connected through the cooling system of the main engine to preheat the latter for starting.



Above: Midship section and section through ward room aft of new cutter for Coast and Geodetic Survey. Below: Deck plans and inboard profile of new cutter.



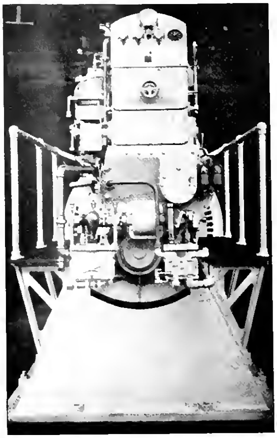
Winton Diesel For Mississippi Flood Control

THE Winton Engine Company, Cleveland, Ohio, has recently delivered to the Mississippi River Commission, Third District, Vicksburg, Mississippi, a 6-cylinder, 225-horsepower, new-type Winton diesel generator set, which will be used as the main power plant in a new government barge to be employed in the revetment work along the Mississippi River which the Commission is pursuing as part of the Mississippi flood control program.

This power plant consists of an airless injection Winton diesel, direct-connected to a 3-phase, 60-cycle, 480-volt, alternating-current generator supplied by the General Electric Company, Schenectady, New York, and will furnish power for the cranes, hoists, mixing units, and other machinery on the barge, which will be engaged as a concrete mixer for mixing and placing concrete used in the construction of precast units of concrete mattress. The Winton diesel engine used in this unit is an exceptionally sturdy, compact engine, delivering its rated power output smoothly and efficiently. This same type of Winton engine has made such a remarkably fine record in various kinds of strenuous service that its selection for this government work is quite logical.

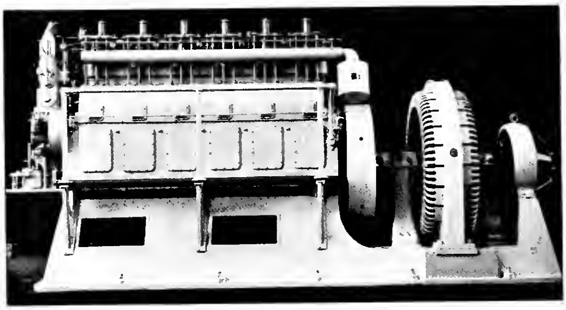
The barge on which it will be used is 120 feet long; 36 feet beam; 7½ feet molded depth.

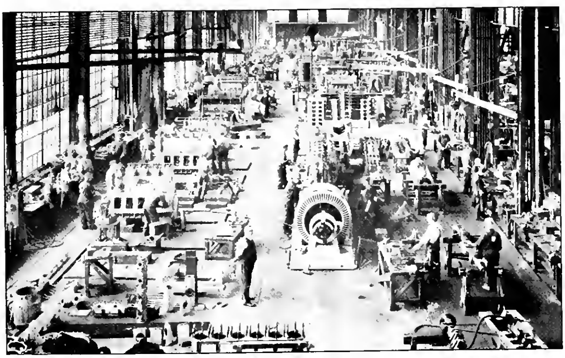
It is interesting to note that when this engine was shipped from the Winton plant in Cleveland, the company had under construction engines of various kinds totaling more than 56,000 horsepower.



Vancouver Built Diesel

A new workboat, Pikes Peak, has recently been put in commission at Vancouver, B. C. This craft has the distinction of being the first to be equipped with the new **Cameron** 2-cycle diesel engine, built at Vancouver. It is claimed that this power plant retains all of the good features of the older engines, with many new ones to suit special coast conditions. It is rated at 55 horsepower and is said to be exceptionally economical in fuel and lubricating oil consumption. It was built by the **Cameron Diesel Engineering** Works, of Vancouver, B. C. The Pikes Peak will be operated by Capt. Kildall in the off shore fishing business.





Upper view shows the operating end of the 6-cylinder 225-horsepower, new type Winton diesel for generating set for Mississippi River flood control revetment barge.

Central illustration shows side view of the Winton-General Electric diesel generating set for Mississippi River Commission.

Lower illustration shows one of the bays in the erecting shop of the Winton plant at Cleveland, where the company has under construction a total of over 56,000 horsepower in Winton diesels.

Auxiliaries-Ship Supplies-Marine Equipment

Auxiliaries and Equipment on Virginia

(Continued from Page 15)

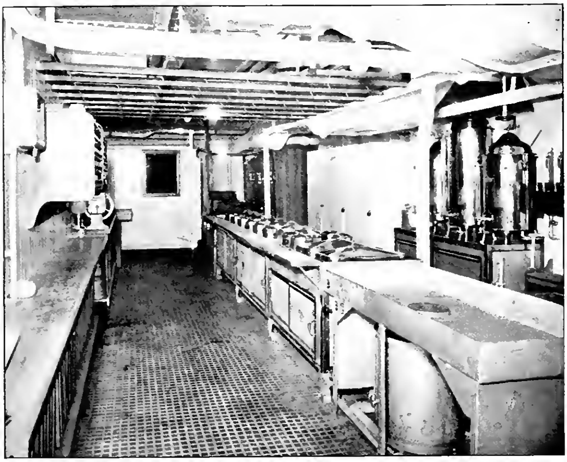
phone system is provided for ship's service but not for passengers' rooms. A very complete bell system is installed for room service. These are served by two 10-cell Exide batteries. An electric clock system gives the time in the public spaces.

Auxiliary Electric Plant.—Lighting and power are supplied by four General Electric 500-kilowatt, 240-volt, direct-current, geared turbine-driven generators, operating on full boiler pressure. Two of these machines take care of the normal load at sea. The generators are arranged for normal operation as two wire machines in parallel supplying the 240-volt, two-wire lighting system and power bus and with compensators as modified, three-wire machines supplying the 120-240 volt excitation and auxiliary bus.

The lighting sets exhaust into the auxiliary condensers, interchangeably. These condensers are of 2800 square feet of cooling surface, have motor-driven circulating pumps, condensate pumps, and two-stage Wheeler radojets.

The emergency sets consist of two 15-kilowatt, 120 to 240-volt, direct-current generators, driven by 30-horsepower gasoline engines. These, together with a 120-cell Exide Ironclad storage battery for lighting or radio, are located in a special room built on top of the boat deck houses. Emergency lights go on automatically if the main sets fail.

The main switchboard is located in the engine room flat abaft the lighting sets. It has forty-three power circuits, thirteen lighting circuits, four propulsion excitation circuits and spares. The four 500-kilowatt generators are connected through selective circuits mechanically interlocked so that only one generator can be used for propulsion excitation.



Pantry for tourist service equipped with steam table and various electrical equipment, such as egg boilers, toasters, mixers, and cutting machines.

Refrigerating Plant.—Two systems of refrigeration are provided, namely, 60,000 cubic feet of cool air chambers for the carriage of bananas, citrus fruits, fresh vegetables, or the like requiring ventilation and a temperature of around 50 deg. Fahrenheit, and 40,000 cubic feet of frozen space for meats. Fifteen thousand additional cubic feet of frozen space is provided for domestic use, and there are also a number of smaller ice-boxes, ice-cream rooms, or cool places. This large amount of refrigeration is provided by four Brunswick-Kroeschell carbon dioxide, three-cylinder motor-driven compressors, adjustable speed, 250 to 350 revolutions per minute. There are four condensers and four brine coolers. All equipment is located in a separate room abaft the engine room. Access is given from the refrigerating engine room to the fan rooms overhead. The brine circulating pumps and condenser circulating pumps are motor-driven. An excess machinery capacity of 25 per cent is provided in case the owners wish at any time to increase the capacity by this amount.

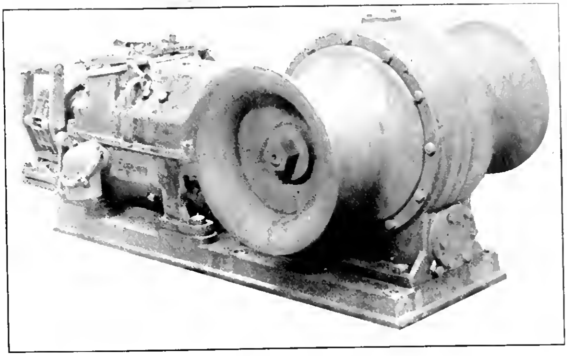
Condensing Apparatus. — The main condensers take steam from the main propulsion turbines only, and are underneath and directly connected to them. Each condenser has 11,000 square feet of cool-

ing surface. They are circular, two-pass, and are fitted with 5300 tubes each. The Warren circulating pumps are centrifugal, motor-driven, two pumps per condenser, each being capable of taking care of its condenser at normal load. The capacity of each pump is 8000 gallons per minute. The motors are 100 horsepower, 230 volts, 325 to 600 revolutions per minute, magnetic control. Each condenser is provided with motor-driven, 2-stage condensate pumps and Wheeler 2-stage radojet air ejectors.

Feed Water Heating.—There is installed a system of 2-stage feed water heating. The first stage heater raises the temperature of the feed water from 100 deg. to 200 deg. Fahrenheit, and is supplied with steam bled from the main turbines. The second stage heater raises the temperature to about 230 degrees, and is supplied by auxiliary steam. The Davis heaters are of the vertical straight tube type, and are on the pressure side of the feed pumps.

Other Auxiliary Machinery.—Motor-driven: 3 sanitary pumps, 2 oil cooler circulating pumps, 1 standby condensate pump, 1 ice water circulating pump. Reciprocating: 1 lubricating oil pump, 1 fresh water pump, 1 ballast pump, 1 sediment pump, 1 fire and general service pump, 1 engine room bilge pump, 1 boiler room bilge pump, 1 hot fresh water pump, 1 evaporator feed pump. Evaporating plant: 3 Davis Paracoil 50-ton evaporators, 2 Davis Paracoil 10,000-gallon distillers, 1 De Laval lubricating oil separator, 1 Bethlehem fuel oil separator, 2 motor-driven, dry pit sewage pumps.

Boiler Insulation.—For insulating the steam pipes and boilers of the Virginia, Thorkote is being liberally used on account of its tough wearing surface, which reduces maintenance expense to a minimum.

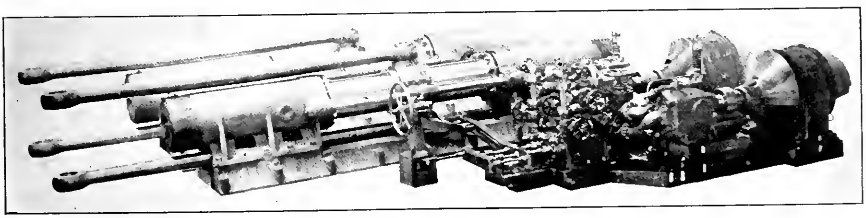


Special Stateroom Ventilation. — An innovation on the Virginia is the installation of 139 specially designed folding wind scoops for stateroom port lights. This device was gotten out by the Kearfott Engineering Company of New York and consists of semi-circular interfolding leaves of stainless steel, held by a pivot at top and bottom; this pivot being tapped into the frame at the port light.

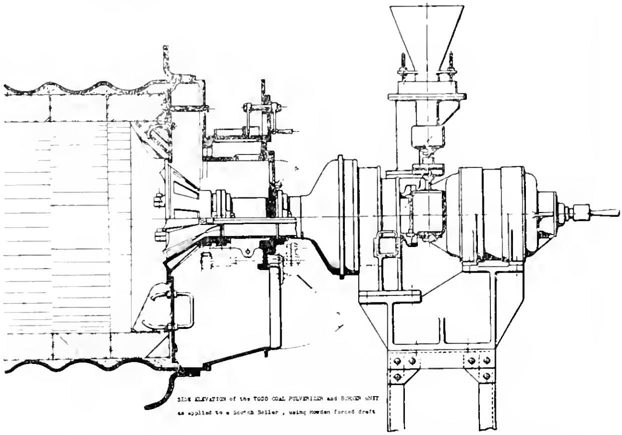
Kearfott Engineering Company designed, along with this scoop, a brass screen which fits into the standard port light, either closed or open, without disturbing the function of the fitting.

Stateroom Heating—All staterooms and bath rooms are heated by Edison Hot Point, surface mounted, wall type heaters, finished in a light cream porcelain enamel for staterooms and standard white enamel for baths. There are 163 600-watt, 127 660-watt, and 52 1000-watt heaters installed. Incidentally all of these heaters were manufactured in southern California.

Three illustrations on this page feature Hyde deck machinery and Hyde hydro-electric steering gear.
The central view, showing the windlass, features also Naco cast steel stud link anchor chain.



Todd Pulverized Coal Burners



The Todd coal pulverizer and burner unit as applied to a Morrison furnace on a Scotch marine boiler, using Howden forced draft. This very simple unit showed remarkable results on recent official tests at the fuel oil testing plant, League Island Navy Yard.

OFFICIAL tests recently concluded on the new type pulverized coal burners at the Fuel Oil Testing Plant at League Island Navy Yard have effectively demonstrated the application of individual pulverizing mills for each burner.

Complete data will not be available until all analyses have been made. Evidence at hand, however, together with the consensus of opinion of the engineers in charge of the test, indicates a splendid showing of combustion conditions and that the over-all efficiency of the burner and boiler exceeded expectations.

These tests were the direct result of experiments made by the Todd Dry Dock, Engineering & Repair Corporation over a period of two years in their Brooklyn plant. Many different types of burners were used as well as different applications of primary and secondary air conditions.

Up to this time all experimentation has been confined to the burning of pulverized coal in the furnaces of Scotch marine boilers, marine engineers generally conceding that this was the most difficult condition to meet. With the successful accomplishment of this, the aim was to develop an apparatus that would have a universal application regardless of whether the present fuel being burned was oil or coal on the grate, and having in mind that cost of apparatus and its installation, its weight and bulk, and simple method of operation were all features of vital importance to the ship operator and owner. In comparison to systems heretofore used aboard ships, there is a very decided difference in weight in favor of the Todd system.

The apparatus which was finally developed and used in the tests is a remarkably simple machine, consisting of a motor or turbine driven impact mill with two stages of pulverization, containing a fan to furnish primary or carrying air and feeding apparatus to regulate the amount of coal going into the mill.

Marine engineers, naval architects, marine surveyors and other maritime experts gathered at League Island to witness tests of the Todd coal pulverizer and burner unit.

The equipment is very compact and rugged, a complete unit is installed on each furnace front. The flexibility of such an installation is an outstanding feature, and will appeal to all operators, since it now becomes possible to operate all fires independently. No one unit is in any manner dependent upon its neighbor.

Shipowners will appreciate the fact that it will not be necessary to alter bunkers or hull structure in any way to make an installation of these new type burners or for any system of coal conveying from bunker doors to pulverizers.

Burning of pulverized coal will always require the attention of operators, but when this feature is reduced to the simple manipulation of secondary air and amount of coal fed into the pulverizer as in this new type, it is then reduced to a minimum and comes within the easy range of the usual fireroom attendant.

The burners demonstrated were applied to a regular form of Howden forced draft front, with only such changes to the front itself as are usually made when changing from coal to oil burning, and the secondary air coming from the Howden fan was approximately of the same pressure as used when burning coal on the grate. This is of importance since it admits of the use of the same draft fan and ducts as exist in the ship, and does not destroy the usual coal-on-the-grate operation, should that for any reason be desirable.

The capacity of the burners demonstrated has been shown to be from 200 pounds to 600 pounds per hour per burner, this range is well within any requirement usually found on a Scotch boiler furnace, and this circumstance, added to the fact that all burners are independent of each other, makes for a flexibility very much to de desired.

The grade of coal burned had a B.T.U. value of about 14,000, and due to the fineness of pulverization and complete combustion there has been no ash trouble, as most of the ash is fine enough to pass away with the gases through the stack.

The flame produced is a short, turbulent one, and, due to its turbulence, the inert gases usually found between the flame and heating surface are brushed away, thus increasing the evaporating efficiency of this heating surface.

On November 13, a company of representative shipowners and operators, together with the Fuel Conservation Committee of the United States Shipping Board, paid a visit to the Fuel Oil Testing Plant for the purpose of witnessing the Todd pulverized coal burners in operation during the final period of very exhaustive tests made by Navy and United States Shipping Board personnel, and consensus of opinion was that these burners were a very fitting tribute to the business of burning pulverized coal, and there were many expressions of satisfaction with this new development.

The Todd Corporation has a number of inquiries from shipowners which indicate a very keen interest in this subject, and it expects to make an installation aboard a freight ship in the very near future, which no doubt will be watched by others equally anxious to equip their ships.

Summary of General Electric Marine Activities During 1928

By D. W. Niven, Manager,
Federal and Marine Department, General Electric Company.

THERE was a decidedly progressive trend in the marine electrical field during the year 1928. Most noteworthy was the entry of the all-electric passenger liner, which is bound to have a far-reaching influence in the future design of such vessels.

The airplane carriers Saratoga and Lexington underwent their sea trials and, as previously expected they would do, broke all existing speed records for capital naval vessels. The Saratoga over a measured mile course maintained a speed of 33.42 knots. The Lexington maintained a speed of 30.7 knots for 72 hours 34 minutes between San Pedro, California, and Honolulu, a distance of 2228 nautical miles. In addition, the Lexington broke the record for sustained speed for periods of 24, 48, and 72 hours for any class of vessel. This record was formerly held by a commercial vessel, the steamship Mauretania.

In the diesel-electric field, there has been a steady, consistent increase in the amount of power applied to a single propeller shaft, and an expansion of its field of application. Three new types of vessels to adopt diesel-electric drive during the year were the tunnel stern propeller type of river towboat, the packet boat, and the lightship.

In the auxiliary field, the totally-enclosed, fan-cooled motor for continuous duty became firmly established. Automatic and magnetic types of starters also gained in favor.

Diesel-Electric Drive

Diesel-electric drive made rapid progress during 1928. The new fields of application which it entered and the extension of its power limit showed the soundness of its basic principle and the flexibility with which it adapts itself to a wide variety of ships.

One of the most outstanding installations is that of the motorship Courageous, a converted freight vessel owned by the United States Shipping Board. This vessel, formerly a turbine-gear-driven vessel of 3000 shaft horsepower, was re-engined with a diesel-electric power plant of 4000 shaft horsepower capacity. A new propeller with a designed full load speed of 60 revolutions per minute was installed in place of the former propeller, which operated at 90 revolutions per minute. The bow and stern lines of the vessel were also changed. These changes result in an increased ship speed of from $10\frac{1}{2}$ to more than 13 knots. Diesel-electric drive was selected in preference to direct diesel drive because of its lighter weight, saving in space, and lower first cost. The main power plant consists of four diesel engine driven, direct-current generators, each rated 800 kilowatts, 250 revolutions per minute, 385 volts. On the end of each main generator shaft is connected an auxiliary direct-current generator of 100 kilowatts capacity, for furnishing power for excitation and the auxiliaries and lights. The main propelling motor, directly connected to a single propeller shaft, is of the double-motor type and is rated 4000 shaft horsepower, 60 revolutions per minute, 1500 volts.

In the turbine-electric field of propulsion, the passenger liner California created the greatest interest both here and abroad. During the year that she has been in service she has established new standards of efficiency, comfort, convenience, and "up-to-dateness." Her sister ship the Virginia is now on her maiden voyage.

Westinghouse Marine Developments in 1928

By H. C. Coleman, Manager,
Marine Engineering Section, Westinghouse Electric & Mfg. Company.

THE year 1928 has been marked by considerable advances in the art of application of electrical machinery to shipboard use. Advances have been made both in the field of propulsion and in that of auxiliaries.

The diesel-electric system of ship propulsion has been extended to the field of ocean cargo vessels. During this year, the propulsion plants for the two Shipping Board vessels Triumph and Defiance have been completed and the installation is now being made. These vessels are being converted from steam drive to diesel-electric drive with some alterations in the hull and with increase in propulsive power to effect an increase in speed from 10 knots to about 13½ knots.

These propulsion plants represent the largest of the diesel-electric type yet to be constructed. Each vessel will have a single propulsion motor rated at 4000 horsepower, 60 revolutions. Power for this motor will be supplied by four 800-kilowatt generators driven by McIntosh & Seymour diesel engines. Each generating unit also has a 100-kilowatt direct-connected exciter. These machines furnish power for excitation of the complete propulsion plant and power for all the ship's auxiliaries. The control equipment is of the modern dead-front type, providing Westinghouse variable voltage system for control of the propelling motor. Equipment has been included for pilot house control.

The operation of these vessels will be watched with a great deal of interest because of the size of the propelling plant, and because of the low propeller speed which is expected to result in a very efficient propeller.

Three of the five turbine-electric Coast Guard cutters have been put into service this year. These cutters have been constructed at the Fore River plant of the Bethlehem Shipbuilding Corporation. The propelling plant for each vessel consists of a 3000 shaft horsepower synchronous motor receiving power from a single turbine generator unit. The most important advance made on this installation has been the provision for taking all auxiliary power, when under way, from the main generator, with consequent low fuel rate. This has been accomplished by using a 3-unit auxiliary set consisting of an auxiliary steam turbine, synchronous motor, and direct current generator. When the ship is under way at any speed between two-thirds and full speed, the synchronous motor of the 3-unit set takes power from the main generator and drives the direct current generator which supplies power for excitation and direct-current auxiliaries. Power for the remainder of the auxiliaries, which are of the alternating current type, is taken directly from the main generator through a transformer.

There are two of these three-unit auxiliary sets, one being a spare. The control is arranged so that whenever the operator reduces the speed of the main turbine below two-thirds as in maneuvering, the synchronous motor of the 3-unit auxiliary set is automatically disconnected from the main generator and steam is automatically turned on the auxiliary set turbine, which picks up the load. When maneuvering is completed and the ship is again brought to a continuous operating speed above two-thirds, the auxiliary set may again be synchronized with the main generator.

Complete tests were made on the second vessel of this group to be completed. The tests showed that a saving of approximately 8 per cent of the total steam used was effected by taking power for auxiliaries from the main turbine, over that required with electrical auxiliaries with power being supplied with the auxiliary turbine generator set.

Diesel-electric power plants are becoming more and more popular for application of dredges of all kinds. This is particularly true of the pipe line class of dredges, several of these dredges having been completed during the last three years. Another very large unit of this type has just been completed by the Ellicott Machine Corporation, Baltimore, for service at the Panama Canal. This dredge, the Las Cruces, has a main power plant consisting of four 1200-horsepower, Fulton diesel engines, each unit driving one 550-kilowatt, and one 200-kilowatt generator. The main pump is driven by a 2500-horsepower, double unit, direct-current motor, which receives power from the four 550-kilowatt generators. The smaller generators supply power to the cutter motor, ladder hoist, swing winch motor, spud hoists, and numerous other auxiliaries.

The layout of the plant in this dredge is such as to give the maximum of flexibility and reliability. The main pump may be operated from any combination of main generators. The variable voltage system of control is used for starting the dredge pump, making a simple and flexible control installation. The swing winch may be operated from any one of the four 200-kilowatt generators, while arrangements are provided for connecting any two of these generators in series on a bus for supplying 240-volt power to the 350-horsepower cutter motor and other auxiliaries. An inspection of this dredge will quickly disclose the advantage of being able to arrange the machinery in the best possible manner when using the electric drive.

Another interesting application of the diesel-electric propulsion system is that for the U.S. Coast and Geodetic Survey vessel Hydrographer. This vessel will be propelled by a 650-horsepower, double unit, direct current motor, receiving power from two main generators driven by Winton diesel engines. Due to the character of the work performed by this vessel, it was imperative that very close speed control be obtained. It was, therefore, decided to use the diesel-electric system since it is possible to obtain with a simple variable voltage control system, 30 speeds equally spaced between zero and full propeller speed, either ahead or astern. This makes an ideal arrangement for this vessel.

The popularity of the diesel-electric propulsion system for ferryboats has again been shown by the decision of the San Diego & Coronado Ferry Company, San Diego, California, to install this type of plant in the modern new ferry boat which they are having built at The Moore Dry Dock Company, Oakland. This ferry will be driven by two 750-horsepower, direct-current motors, receiving power from two

generators driven by Atlas-Imperial diesel engines. One propelling motor is mounted at each end of the vessel, and the full propelling power is developed by only one unit, depending upon the direction in which the vessel is traveling. The bow motor is turned over only at sufficient speed to overcome resistance.

The success of the diesel-electric form of propulsion for tugboats has been further indicated by a repeat order from the Pennsylvania Railroad Company for the equipment for two more harbor tugboats. When these are completed early next year, this company will have a total of nine diesel-electric tugs.

The most important advance in the field of ship auxiliaries has been the development of a high-speed winch motor and control outfit. A number of these units are now being constructed for installation on the vessels now being converted to direct diesel drive by the U.S. Shipping Board.

It will be interesting to watch the progress of electrical machinery in marine engineering during 1929. The progress in this field over the past ten years has been phenomenal, and there is very indication that with the increased activity in marine circles during the coming year, electrical machinery will enjoy an even broader application on shipboard.

Panama Canal Line Again Distributes Carload of Calendars

IN keeping with an old custom, American-Hawaiian Steamship Company has again issued an attractive calendar, thousands of copies of which have been mailed out during the past week to editors and publishers, high government officials, business and industrial firms, newspapers, and prominent individuals throughout the United States and principal ports of the world.

In the last twenty years, American-Hawaiian calendars have become a tradition in maritime circles —almost as widely known, in fact, as the service this line renders, and serving as day by day reminders of the important part the company has taken in the commercial and industrial development of our two great coasts. Founded by intrepid men who began operating clipper ships around Cape Horn between New York and the Pacific Coast five years before the beginning of the Civil War, American-Hawaiian is the oldest of the coast-to-coast common carriers. Thirty years ago the present company was incorporated, and the old sailing vessels were immediately supplanted with steamers which operated through the Strait of Magellan. The company's name is derived from the fact that until the World War its steamers called regularly at Hawaii for sugar cargoes.

With the completion of the Tehuantepec National Railroad in 1907, American-Hawaiian's fleet was divided into Atlantic and Pacific units, and from then until the canal opened, cargo was transported across the Isthmus of Tehuantepec by rail, cutting thirty days from the transit time between Atlantic and Pacific Coast ports. During the World War the company's fleet was turned over to the government and made an enviable record in war transport service. Except for this period it has maintained prompt and regular coast-to-coast sailings ever since the opening of the Panama Canal, growing steadily with the trade it serves. During the past year its ships transited the canal a total of 200 times and paid total canal tolls of $1,187,788.33. Its present fleet of 23 modern motorships and steamers, and an unsurpassed personnel of officers and men, affords shippers a prompt and economical service, with almost two sailings a week both east and west bound via the Panama Canal.

During the past year American-Hawaiian has also entered the foreign trade. In association with the Matson Navigation Company it purchased 21 ships from the govern- Oriental Navigation Company, ment and launched the Oceanic and which links the Pacific Coast with North and South China, Japan, French Indo-China, the Philippines, Australia, and New Zealand.

American-Hawaiian's head offices are in San Francisco, with branches in New York, Boston, Philadelphia, and other large eastern cities. Officials of the company are Roger D. Lapham, president; John E. Cushing, vice-president and traffic manager; Thos. G. Plant, operating manager; J. D. Tomlinson, vice-president; W. S. McPherson, Atlantic Coast traffic manager; and W. J. Mahoney, secretary and treasurer.

Many New Yachts to Have Gyro-Stabilizers

THE Sperry Gyroscope Company has recently received orders for stabilizers for the two yachts building by The Pusey & Jones Corp. at Wilmington, Del., for Fred J. Fisher and Alfred E. Sloan, Jr., of Detroit. These yachts will each be 235 feet long and displace 1200 tons, and are designed by John H. Wells in association with Cox & Stevens.

The Sperry company recently delivered a stabilizer to Harold Vanderbilt's 150-foot express yacht now nearing completion at the Herreshoff Manufacturing Co., Bristol, Rhode Island, and also has in the course of construction a stabilizer for R. W. Judson of Detroit. This is for a 160-foot yacht now being built at George Lawley & Sons, Neponsit, Massachusetts, from designs by Henry J. Gielow, Inc.

Due to the added size and comfort required on modern yachts, the gyro-stabilizer is becoming most popular with owners who wish to afford themselves and guests the utmost of comfort. In addition to the stabilizer, all of the above yachts will likewise receive the Sperry gyro-compass, gyro-pilot automatic steering equipment, searchlights, and other navigational equipments.

A Land Cruise

A Pacific Coast workboat recently took a land cruise of several hundred miles when the diesel powered tug **Radius** was shipped by rail from Vancouver, B.C., to Okanagan Lake. This vessel, which is 60 feet length by 14 feet beam, is equipped with an Atlas-Imperial 125-horsepower engine. Her shipping weight of about 40 tons made it necessary for the railroad company to provide a 43-ton gun car for the transportation. The loading of the workboat was quite ingenious.

The trip was made with no trouble and the Radius is now a fresh water workboat.

Trade and Organization Notes

New Director Fairbanks-Morse Sales

JOHN A. MANLEY, who has for the past three years been manager of sales development for Fairbanks-Morse & Company, of Chicago, has been elected vice-president in charge of sales, according to a recent announcement of the Board of Directors. Mr. Manley, whose career has been one of rapid advancement in the business world, was formerly manager of accounts for the nationally known advertising agency of Henri, Hurst & McDonald, also of Chicago. In his connection with advertising work Mr. Manley made a detailed study of the problems of industrial business development, and it was the result of this work that brought him into the Fairbanks-Morse organization.

In 1911 he was graduated from Northwestern University and entered the sales department of the Republic Tire and Rubber Co. After four years with this organization he joined the advertising staff of one of the Chicago newspapers. Later he was connected with Hart, Schaffner & Marx, studying the problems of the retail merchant, and after two years in this connection went with Henri, Hurst & McDonald.

The steadily increasing volume of business coming into the Fairbanks-Morse organization shows that the varied sales problems of that corporation are being very effectively handled.

J. A. Manley, recently elected vice-president in charge of sales for Fairbanks, Morse & Co.

A. W. Thompson, recently elected vice-president of Fairbanks, Morse & Co. in charge of business on the Pacific Coast.

Coast Manager Fairbanks-Morse Elected Vice-President

A. W. Thompson, Pacific Coast manager for Fairbanks-Morse & Company has been elected a vice-president of that organization, according to a recent announcement of the Board of Directors at Chicago.

Mr. Thompson, who had been general manager of the Indianapolis Works, where all the Fairbanks-Morse electrical equipment is built, was sent to the Pacific Coast in 1926 to take the position made vacant by the retirement of S. F. Forbes. Mr. Thompson as a vice-president of the company will continue to have charge of the Pacific Coast business for the company.

Mr. Thompson was born in Albany, New York, in 1884, and was graduated from the Rensselaer Polytechnic Institute of Troy, New York, in 1907. Following his graduation he went to New York City with the George A. Just Co., and later with Westinghouse-Church-Kerr. In 1910 he went with the General Electric Co. and remained with them until the spring of 1920, when he left to associate himself with Fairbanks, Morse & Co. While with the General Electric Co. he was in charge of the design and development of the Erie Works. In its varied line of products, which include diesel engines, pumps, motors, scales, railway equipment, small light plants, and automatic water plants, Fairbanks, Morse & Co. has a broad sales problem. That the problem is being effectively handled under the present Pacific Coast management is shown by the steadily increasing volume of business.

C. E. George Joins Taylor

C. E. George, for many years western manager of the American Schaeffer & Budenberg Corp., has recently joined the sales staff of the Taylor Instrument Companies of Rochester, N.Y. He will be associated with the Chicago office of the Company, with headquarters at 58 East Washington Street, Chicago, Illinois.

National Soot Blower Agents

The following western agents were recently appointed by the National Flue Cleaner Company, Inc., of Grovevill, New Jersey, to handle the National Soot Blower for fire tube boilers: McGee Sales Agency, 75 Fremont Street, San Francisco; Flickinger, Meyers & Rudolph, 129 W. Second Street, Los Angeles; and Manufacturers Sales-Service, P.O. Box 655, Salt Lake City. W. A. Ramsay, Ltd., of Honolulu, was appointed representative for Hawaii.

John F. Gilmore, recently appointed manager of the Enterprise Engine Company of San Francisco. Mr. Gilmore has had long experience in mechanical and in diesel engineering, as noted in the December issue of Pacific Marine Review.

Marine Insurance

Edited by JAMES A. QUINBY

Did Salvage Sink the Vestris?

A Business Man's Prayer

Dear Sir:

Please note an humble suppliant kneels
To Thee, an able Business Man who deals
In futures. Keep my eyes unveiled to see
That those with whom I trade are men like me—
That my competitor may be the type
Who cuts his own front lawn and smokes a pipe.
And grant Thy understanding grace which brings
The light of romance to the little things
Which line my path.
I trust, Dear Sir, that you
Will send an early answer.

J. A. Q.

NOW that the official investigation of the Vestris disaster has passed into history, and numerous suits have been filed against her owners to recover for loss of life and property due to her sinking, it becomes pertinent to inquire into the underlying cause of the series of material circumstances leading to the tragedy.

Courts and boards of inquiry are often concerned in too great a degree with material facts. The open coal-port, the rotten lifebelts, the ill-equipped life-boats—all these things were material, concrete elements of the catastrophe. The same items, or similar ones, were present in the sinking of the Titanic, which caused an immediate flurry of inspection and replacement of equipment on passengers vessels. Newspapers, during the past month or two, have been full of virtuous editorials demanding more stringent governmental inspection and regulation of life saving gear. At the risk of being considered cynical, we predict that nothing radical will be done about it, and that when the good ship Mary L. sinks off the coast of Switzerland in 1952, it will be discovered, amid a furor of surprise and righteous indignation, that her boats were provisioned with rat-biscuit, her lifebelts filled with sawdust, and her davits so designed that they wouldn't work when the ship was upside down.

We doubt if the day will ever come when ocean-going vessels are free from defects at the time they sail. Laws designed to impose liability upon the owner of a ship which is unseaworthy when leaving port are framed, not in the belief that perfection will be attained, but in the hope that some efforts in the proper direction will be made. Thus it is that cargo vessels are denied the protection of the Harter Act unless it is shown that a thorough inspection of the ship—even to the minute detail of a rivet or pipe-elbow—has been made before sailing. Such a showing can seldom be made. In individual cases, it is perhaps unreasonable to expect that it should be made. But the realization of its necessity undoubtedly results in a higher degree of care as to details of a vessel's fitness for her voyage.

Material Defects May Be Unimportant

In a case like that of the Vestris, material defects may be unimportant. It may be true that various item of equipment were all "haywire," as we used to say in the good old saddle and quirt days of the Far West. Maybe the Vestris was tied together with cotton string when she left port, but what of it? To defeat limitation by her owners, claimants will have to prove that these same owners — in person, not a motion picture—actually knew all about her condition. And that, brothers and sisters of the radio audience, is difficult to prove.

Failing such proof, the vessel owners will be allowed to limit their liability to the value of the Vestris after the accident, which is something like the Democratic majority in the last election. So when it comes to recovering for a loss, the purely physical defect contributing to a disaster may be of little importance.

As a deterent to future tragedies, the closer inspection of details may have a salutory effect, but even in this field the correction of initial unseaworthiness is no guarantee of safety. If the Vestris had struck an iceberg, as did the Titanic, and been placed in the same condition as when she took her first dangerous list, would Captain Carey's call for assistance have come any sooner?

All of which brings us to the main point of our argument. Out of the maze of conflicting stories by survivors, one fact looms with startling clarity. Entirely ignoring the original cause of the trouble, observers agree that if Captain Carey had called for help when he first knew his ship to be in trouble, loss of life and possibly of property, might have been averted.

A ship is merely a piece of machinery under the control of men. Necessities of discipline and the age-old law of the sea put the entire venture under the control of one man. If that man is hampered in his judgment by considerations which tend to cripple his immediate capability, the venture is in danger, even though the ship and her equipment be in perfect condition.

At the battle of Caporetto, the military materiel of the Italians was fully equal to that of the Austrians, but the Italians' morale had been undermined for weeks by letters circulated among the conscripts from the southern provinces, insinuating that their wives at

home were busily refuting the old adage that absence makes the heart grow fonder. It was later disclosed that these letters were of enemy origin, and that the southern Italian wives were at least maintaining their pre-war standard of fidelity, but the disclosure came too late. The Austrians prevailed, and the noble sons of Rome took one on the nose, not because their equipment was faulty, but because ulterior considerations diverted their attention from the main object of the moment.

In the case of the Vestris, Captain Carey, a mariner of long experience, faced a serious emergency, and delayed in taking the logical steps to relieve the situation. Why?

Did Carey Fear Salvage Charges?

From time immemorial, the law of the sea has decreed a generous payment to salvors out of property saved at sea. As Hughes, J., remarks in The Egypt, 17 Fed. 376:

> "Salvage consists—First, of an adequate compensation for the actual outlay of labor and expenses made in the enterprise; and second, of the reward as bounty allowed from motives of public policy as a means of encouraging extraordinary exertions in the saving of life and property in peril at sea. The first of these items of award admits of computation; the second does not, and is usually determined with more or less reference to the value of the property saved."

And in The Pleasure Bay, 226 Fed. 55, it is said:

> "Elements to be considered in case of salvage service are: The labor expended by the salvors in rendering the service. Promptitude, skill, and energy displayed in rendering the service and saving the property. The value of the property employed by the salvors, and the damage to which such property was exposed. The risk incurred by the salvors in securing the property from the impending peril. The value of the property saved. The degree of danger from which the property was rescued."

On the above principles, the Vestris, if saved, faced the possibility of paying a heavy salvage award to her salvors. Captain Carey knew this. He also knew that his owners, if he avoided salvage, would be duly appreciative. In such a dilemma, being only human, he hesitated—and was lost.

Our comment is in no sense condemnatory to the memory of the master of the Vestris—a gallant seaman who made a mistake, and, realizing his mistake, went down with his ship. We do feel, however, that those unfamiliar with the principles of salvage should realize the important bearing which the element must have had in the case, and must have in future cases.

Nor do we presume to suggest a remedy. Our courts have recently said that any restriction upon salvage awards would result in a lessening of efforts to save life and property, and unflattering as such a statement may be to our cherished conceptions of humanity, it is probably true. The average shipowner, backed by the average underwriter, will not send a valuable vessel into danger to help others if he knows his only reward will be a pat on the back and the inward glow which comes from the consciousness of a good deed well done.

The situation will be helped by higher standards in life saving equipment. It might be helped by making radio operators directly answerable to the government. But so long as the present balance exists between greed and the finer human instincts, salvage will continue to be a golden rainbow to the salvor and a mental handicap to those in distress.

Management vs. Care and Custody

UP until the passage of the Carriage of Goods by Sea Act of 1924, it mattered little to the British shipowner whether the act of his agents which damaged cargo was an act in the management or navigation of the vessel (for which, under the Harter Act, he could exempt himself in the United States) or an act in the care and custody of cargo, for which a shipowner in the United States cannot exempt himself. In England, prior to the passage of the act mentioned, a shipowner could, by proper provisions in his bill of lading, exempt himself from all negligence of his servants.

The distinction since the passage of the act, however, is similar to that in the United States, as shown by the final decision in Millard vs. Canadian Government Merchant Marine, reported in Aspinall's Maritime Law Cases, Vol. XVII., p. 385.

In that case, certain tinplate was damaged by rain water which gained entrance into the hold of the Canadian Highlander while the vessel was undergoing repairs after a collision. In the King's Bench, it was found that the officers of the vessel were negligent in leaving the hatches open, which was held to be an act in the care of cargo. Judgment was accordingly for the plaintiff.

On appeal to the Supreme Court of Judicature, the decision of the lower court was reversed. The final decision was by the close score of 2 to 1, Scrutton and Sargent considering the open hatch an act in the navigation of the vessel, while Greer was willing to let well enough alone and string along with the King's Bench.

Scrutton, L. J., in his decision, comments as follows:

"The question, therefore, is whether the facts found by the judge amount to 'neglect or default of the servants of the carrier in the management of the ship.' Unassisted by authorities I should have felt no doubt that they did. Assuming that the words deal with the management of the ship as a physical entity, and not with the management of the cargo-carrying adventure on which the shipowners and the cargo-owners have agreed to use the ship, what has been managed here is the hatches of No. 5 hold, an essential physical part of the ship. For the purpose of repairing damage to the ship in order that she may resume her voyage, those hatches have been physically dealt with and dealt with so negligently that, during their absence in rainy weather, such quantity of rain have entered the hold as to damage the cargo in the hold. I cannot understand why on the words themselves, without reference to any authorities, this is not negligence in the management of the ship, or a substantial physical part of the ship."

In discussing the existing law on the point, the court deals none too gently with the United States decisions, saying, in part:

"It is difficult to reconcile the decision of the United States courts with themselves or with the English decisions; and the Harter Act itself differs widely from the English Act. This arises partly from the fact that the United States courts treated all negligence clauses in contracts of affreightment as contrary to public policy, and the Harter Act was therefore an allowance of clauses which were contrary to public policy, and as such were to be restricted; while the English courts allowed freedom of contract and limited provisions which restricted that freedom. From this point of view Sects. 1 and 2 of the Harter Act were treated as the fundamental purpose of the Act, and, as Holmes, J. said in The Germanic (196 U.S. 589), removed matters which would otherwise be within the exceptions of Sect. 3 from its operation. The English Act, on the other hand, expressly makes the obligations of arts. II. and III. subject to the immunities and exceptions of art. IV. In The Germanic (sup.) a combined operation of loading coal for ship's use and of discharging cargo was conducted so negligently that the ship lost her trim and capsized. This was held not to be management of the ship. I should have thought that it clearly was such management, just as the provision of ballast would be. The United States courts have held management of the ship not to include: Insufficient covering of hatches (The Jeannie, 236 Fed. Rep. 463), failure to open hatches to ventilate cargo (The Jean Bart, 197 Fed. Rep. 1002), failure to close during rough weather hatches which had been opened to ventilate cargo (Andean Trading Company vs. Pacific Steam Navigation Company, 263 Fed. Rep. 559), negligent management of refrigerating machinery (The Samland, 7 Fed. Rep. (2nd series) 155). I should have decided all these cases differently."

In the divergence of decisions on this apparently simple point can be seen the tendency of American courts to favor cargo interests in an exporting country and the grim determination of British courts to protect the shipowner in a shipowning country, in spite of the Carriage of Goods by Sea Act.

Mixed Cargo

Those of us who have cases pending before the federal courts may be encouraged by reading the report of The James G. Swan, in 1928 A.M.C. 1592, which chronicles the final outcome of an unlawful seizure occurring in 1891. The libelant recovered damages and all that, and it took only thirty-seven years.

Headline in daily paper:
"Shipping Board Optimistic over Prospects for Next Year."

Well, on that basis, there's no excuse for anybody to be pessimistic. If we could point with pride to our profits (if any) and refer our losses to the tax payers, we'd be optimistic, too.

The Study Class sponsored by the Marine Underwriters of San Francisco, now well launched on its eighth year, held the fourth meeting of the term on Monday evening, November 19, in the Merchants Exchange Building when the members had the pleasure of hearing Guido Marx of the Standard Oil Company and Stewart P. Elliott, general manager of the Sperry Flour Company.

Mr. Marx described the "flue-gas" system for reducing the fire hazard on tankers, which the Standard Oil Company has installed on several units of its fleet during the past two years. The system as described by Mr. Marx consists of an arrangement of pipe lines leading uninflammable gases from the stack of the vessel

in such a way that they are drawn into the cargo tanks by the vacuum created when the tanks are emptied. When the tanks are full, the "flue gas" is forced out over the same system of piping and escapes through a vent in the top of the mast. The record of the Standard Oil Company in connection with this installation has been very satisfactory, and the fire hazard formerly attaching to partially emptied tanks due to the tendency of oxygen in the air to mingle with the petroleum and form an inflammable compound has been practically eliminated.

The second speaker of the evening, Stewart P. Elliott, of the Sperry Flour Company, indicated by means of maps the general points of origin and distribution of spring and winter wheat in the United States and other parts of the world. He described the trade routes affected by this product and the methods of manufacture, pointing out that the transportation of flour is an excellent risk from the viewpoint of both the carrier and insurer, as there is seldom a loss which is not diminished by a high percentage of salvage.

Mr. Elliott is of the opinion that lumping or caking, a form of damage which has been a thorn in the side of underwriters recently, is the result of a combination of pressure and moisture, and is apt to result where flour is stowed in too great a quantity or without sufficient ventilation. He further expressed the opinion that this type of damage will more often be found in the softer varieties of flour such as that made from the winter wheat raised in the southern part of the United States.

At the fifth meeting of the class held on December 3, the somewhat devious but always interesting subject of "General Average" was treated in a comprehensive manner by C. S. North, of Johnson & Higgins.

Mr. North, who is well-known to the marine circles of the Pacific Coast as an average adjuster of long experience, gave a brief resume of the fundamentals of his subject, and devoted the major part of his remarks to the modern trend in adjusting practice. He pointed out that adjusters were universally inclining to the more liberal allowances heretofore granted only under American law. To show this trend, Mr. North drew a parallel, section by section, between York-Antwerp Rules of 1890 and York-Antwerp Rules of 1924, noting that the changes in the later rules are based entirely on pre-existing American practice.

The scarcity of time prevented the answering of numerous questions on general average which members wished to ask, and Mr. North consented to be present at another meeting in the near future at which time it is planned to stage a question and answer session on general average problems.

The second speaker of the meeting was M. J. Buckley, freight traffic manager for the Dollar Line, who discussed "Steamship Operation." Mr. Buckley, a pleasing speaker with a Gatling-gun delivery, took his hearers on a verbal jaunt around the world on the route of the globe-circling service which has made his line famous. He laid particular stress upon the various commodities and local trade routes which combine to make this unique service a commercial success.

Famous last words—From the Vestris:

"We have nothing to communicate."

Trade Literature

Union Diesel Engines is the title of Bulletin No. 63, recently issued by the Union Diesel Engine Company of Oakland, California.

This is a 31 page booklet depicting the Union diesel engine and its separate parts in a very clearly illustrated manner. The booklet contains complete dimensions of all parts and their relation and usefulness in making up the whole engine.

A brief outline of the history of the Union experiences in engine building is given on one page, and this brings out the facts that the Union gas engine, which preceded the Union diesel engine, was the first successful gasoline engine, and was built in 1885; that this company invented the make and break system of ignition for gasoline engines; that this company invented the first vaporizer, commonly called "carburetor"; the first reversing gear for gas engines was its invention; this company built the largest gasoline engine; was the first engine to be installed in a U.S. Navy or War Department dirigible; and other interesting and enlightening facts from the history of this company.

The Union Diesel Engine Company now manufactures only diesel engines. A number of photographs of workboats, towboats, and fishing trawlers, etc., show the many types of heavy duty craft to which these engines have been efficiently applied.

General Electric Company at Schenectady, New York, or any of its branches has ready for distribution on request the following bulletins:

GEA-71B Wound-rotor Induction Motors, 900 Series.

GEA-81B. High-torque Double Squirrel-cage Motors.

GEA-821A. CR2927 Pressure and Vacuum Switches.

Under the title "Pictorial News" the **France Packing Company**, Tacony, Philadelphia, Pennsylvania, has issued two rotogravure sheets showing some installations under unusual conditions on different types of engines and compressors.

This company has also issued a folder entitled "What is the Life of Metallic Packing?" This enumerates some interesting experiences.

TRADE NOTE.

A Barlow type marine elevator is being installed at the Oregon-Washington dock of the Union Pacific System at Portland to facilitate the handling of freight between river vessels and deep water terminals. A similar elevator has just been put into service at the Luckenbach terminal at this port.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Recent Shipbuilding Contracts

The Pusey & Jones Corp., Wilmington, Del., has an order from the Tide Water Oil Company for an oil tanker 255 ft. between perpendiculars, 44 ft. beam, 15 ft. 6 in. loaded draft; 10½ knots speed; 2300 D.W.T.; to have diesel-electric power plant developing 1000 I.H.P.

This company also has an order from Fred J. Fisher of Detroit for a diesel-powered steel yacht engined with two 1100 H.P. diesel engines. The yacht will be 236 feet over-all, 34 ft. beam, 19 feet depth.

Another contract for this firm is an identical yacht for Alfred P. Sloan, Jr., of New York. And a third identical yacht for an owner not named.

Orders for the above three yachts were placed by John H. Wells, naval architect, of 11 East 44th Street, New York, in association with Cox & Stevens of 347 Madison Avenue. They will cost $1,000,000 each, and will make a total of five major jobs for this yard, the fifth being a 126-foot diesel yacht previously ordered.

The Newport News Shipbuilding & Drydock Co. has three important reconditioning and conversion jobs listed for its yard; the President Johnson, ex-Manchuria, for the Dollar Steamship Company (reconditioning), and the steamers City of Elwood and Ward for conversion to diesel power for the U.S. Shipping Board.

Spedden Shipbuilding Co., Baltimore, Md., has an order from the Supervisors of New York Harbor, 39 Whitehall Street, New York, for a steel hull, steam driven patrol vessel, 114 L.B.P., 24 molded beam, 10 ft. 1½ in. mean draft; T.E. engines, Babcock & Wilcox W.T. boilers.

Consolidated Shipbuilding Corporation, New York, has an order for a 35 ft. fishing boat for Leon Goodwin of Philadelphia; 2 44-H.P. Speedways; a 21 ft. coupe yacht tender for Arthur Wheeler, New York. 22-H.P. Speedway; 16 ft. yacht tender for Arthur Wheeler; 1 Universal eng.; 106-ft. cruiser for W. C. Robinson, Pittsburgh, 2 Speedways; a 16-foot yacht tender for same. 1 Universal eng.; a 50-ft. fishing boat for Caleb S. Bragg, New York; 2 170-H.P. Speedways.

Federal Shipbuilding & Drydock Company, Kearny, N.J., has an order for two welded steel barges for the Boston Molasses Co., to be 60-ft. long by 24-ft. 4¾-in. by 7-ft. 6-in.

Nashville Bridge Company, Nashville, Tenn., has orders for the following new work:—One tugboat 50 x 12 ft., 150 H.P. engs.; one dredge 100 x 36 x 8 ft.; five barges, 120 x 30 x 7 ft.

Western Boat Building Company, Tacoma, is reported to have an order from the Merchants' Transportation Company, Tacoma, for a sister ship to the freighter Seatac. The Seatac went into service this year and is powered with a 180-horsepower Fairbanks-Morse diesel engine.

Sun Shipbuilding Company, Chester, Pennsylvania, has an order from the American-South African Line, Inc., New York, for a passenger and freight steamer, 450 L.B.P., 26 ft. beam, 26 ft. loaded draft; 13 knots speed; twin screws, powered with two 4 cyl. Sun-Doxford oil engs. 9350 I.H.P. The vessel is to have accommodations for 60 first-class passengers.

This yard is also under contract to build a tanker for the Sun Oil Company 245 L.B.P.; 43 beam; 15 ft. 6 in. draft; 8 knots speed; 2300 I H.P. Bessemer oil engs.

The vessel is to be of the three-deck type, with passenger accommodations on upper deck. Freight capacity will exceed 464,000 cubic feet bale measurement.

All auxiliaries are to be electrically driven, power being supplied by three diesel-driven motor generators. The vessel will be built under the supervision of John J. Farrell, Arthur R. Lewis, and Leigh C. Palmer, directors of the American South African Line.

Defoe Boat and Motor Works, Bay City, Mich, has an order from John H. Wells, naval architect, of 11 East 44th Street, New York, for a yacht for Chas. F. Ketterling, to be 170 feet long, 26 feet beam, and powered by two Winton diesel engines developing speed of 14 knots.

Robert Jacob, Inc., City Island, New York, has an order from John H. Wells, naval architect of 11 East 44th Street, New York, for a yacht for Jules S. Bache, of New York, to be 112 feet long, 19 feet beam, powered by Winton diesel engines developing speed of 18 knots.

Mojean & Ericson, boat builders, of Tacoma, Wash., have received an order through H. C. Hanson for an 80-ft. diesel engined tug and cannery tender for the Northwestern Fisheries Co.

New London Ship & Engine Co., Groton, Connecticut, has been awarded contract by New York State Department of Mental Hygiene, Albany, for two diesel-electric ferryboats to cost $207,000 for the construction and $110,000 for engines supplied by the Winton Engine Company; the electrical machinery to be supplied by General Electric Co. The boats will be 115 feet long.

Albina Marine Iron Works, Portland, Oregon, has been awarded contract by the U.S. Coast and Geodetic Survey for a survey boat for Alaskan service to be powered with Atlas-Imperial diesel engines and to cost $55,640. On another page of this issue will be found the plans of the boat.

This yard has an order on hand for a diesel tugboat for Captain Milton Smith of Rainier, Oregon, to be 65 feet long and powered by a 250 - brake horsepower Atlas-Imperial diesel engine.

Some Shipbuilding Work In Prospect

Hudson River Night Line Opens Bids.

Henry J. Gielow, Inc., naval architect, 30 Church Street, New York, has opened bids for the construction of two diesel-powered passenger and freight river vessels for the Hudson River Night Line of New York. The vessels will be 325 feet long, 58 feet beam, 23 feet depth, with twin screws and 1600 horsepower diesel engines.

Ward Line Plans Two Vessels

The New York & Cuba Mail Steamship Company, foot of Wall Street, New York, has called for bids for the construction of two passenger and cargo vessels for the Ward Line. The vessels will be 508 feet over-all, 69 feet 8 inches beam, and 39 feet depth; powered with geared turbines developing 14,600 on twin screws. Theodore E. Ferris, naval architect, 30 Church Street, New York, is designer of the vessels, which will have accommodations for 378 first class and 90 second class passengers.

Dollar Line Plans Feeder Service.

According to a recent announcement, the Dollar Steamship Company of San Francisco is preparing plans for two 16-knot passenger and cargo steamers for use in the Philippine inter-island trade and to act as "feeders" for the company's trans-pacific and round-the-world service. R. Stanley Dollar, vice-president of the Dollar Line, predicts a tremendous development along commercial lines in the islands within the next few years.

To Recondition Shipping Board Freighters

The General Engineering & Drydock Company of San Francisco has purchased the Shipping Board freighters Diablo and Mohinkis and have moved the vessels to its Oakland shipyard for re-engining. The Diablo, a steel vessel of 9656 deadweight tons, will have a reciprocating steam engine or a diesel engine installed, specifications subject to approval by the Board. The Mohinkis, of 9637 deadweight tons, is to have her present turbine engines removed and a 2800 indicated-horsepower reciprocating engine installed in its place. The estimated cost of installing reciprocating steam engines is $100,000 for each ship.

Pilot Boat Planned

Los Angeles Harbor Board will open bids at its San Pedro office the end of December for the construction of a new pilot boat for the harbor to replace the Catherine Cryer. The boat will have a length of 60 feet, and will probably be diesel powered. Geo. F. Nicholson is harbor engineer.

Repairs to Freighters

The States Steamship Company of Portland, Oregon, has purchased from the Shipping Board the steamer West Hartland, and she will be reconditioned at an estimated cost of $51,600. This firm also purchased the Shipping Board freighter West Harts, which will be reconditioned at a cost of about $86,467.

Pillsbury & Curtis, ship brokers of San Francisco, have purchased the laid-up Shipping Board freighters Heber, Mursa, and Fort Wayne. The Mursa will be reconditioned immediately by the General Engineering & Drydock Co., Oakland, for spot service. It is not stated what will be done with the other two.

Walter Martignoni, of the firm of Pillsbury and Curtis, San Francisco, is now in San Pedro supervising the reconditioning of the liner City of Los Angeles, which, in addition to her usual cleaning and painting, will have twenty staterooms torn out and rebuilt.

Sale of the steamship Chickamauga and the steamship Wekika to C. D. Mallory, of New York, for the lump sum of $60,000 cash was approved by the Shipping Board December 12. The purchaser agrees to perform certain betterments, including installation of a new 2000 indicated horsepower reciprocating engine in the Chickamauga, at a total cost of not less than $120,000. The vessels are of 5591 and 5621 deadweight tons respectively. When made ready for sea they will be used in tramp ocean service.

Bids Opened for Ward Liners.

Bids were opened December 20 in the offices of the New York & Cuba Mail Steamship Company, foot of Wall Street, New York, for the construction of two passenger and cargo vessels for the Ward Line. These vessels will be 508 feet over-all, 482 feet between perpendiculars, 69 feet 8 inches beam, 39 feet depth, and 26 feet draft, powered by geared turbines developing 14,600 horsepower and driving twin screws at a vessel speed of 19 knots. Accommodations will be provided for 475 passengers; all auxiliaries will be electrically driven. Theodore E. Ferris of New York is the naval architect.

Plans for Patrol Boat.

The California Fish and Game Commission, State Building, San Francisco, is still working on plans for a patrol boat which will be between 80 and 90 feet long, powered with diesel engines, and is to incorporate the advantages of high speed with perfect seaworthiness. Mr. Bennett is in charge of the development of these plans. He reports that date of call for bids for construction of the boat is indefinite.

The Victoria Tug Company, Captain A. McGregor, manager, Victoria, British Columbia, is reported to be drawing up plans for a diesel-tugboat.

A firm in Milan, Italy, has reported to the U.S. Bureau of Foreign and Domestic Commerce (Reference 35024) to be in the market for diesel motors and steam turbine engines.

It is reported from New York that Angelo Conti, 11 Broadway, has issued plans and specifications and asked for bids for the construction of four single-screw motor tankers for coastwise and canal trade. The vessels will be 243 feet 6 inches over-all, 235 feet between perpendiculars, 38 feet 6 inches beam, and 15 feet depth.

Manitowoc Shipbuilding Company, Manitowoc, Wisconsin, was low bidder recently for the construction of two car ferries for the Pere Marquette Railroad Company.

REPAIRS

Bids for the reconditioning of the steamer Mount Clay for the coastwise service of the Pacific Steamship Company of Seattle were opened December 15.

The job was bid on by East and West coast yards, the lowest bid indicating that the work will cost in the neighborhood of $1,500,000. This is in excess of the amount the owners have anticipated. No decision has been reached on award of contract up to the time we go to press.

Miscellaneous Shipping Notes

Bethlehem Shipbuilding Corp., Ltd., San Francisco, was awarded contract on a low bid of $54,960 for work of repairs and alterations to the Matson liner Wilhelmina, which is to be extensively improved in her passenger accommodations to fit her for the new service out of Portland and Seattle to Hawaii. Betterments are to consist of the installation of beds instead of bunks, and hot and cold running water in all staterooms, enclosing of promenade deck, and other improvements.

Commercial Iron Works, Portland, Oregon, received contract from the Hammond Lumber Company for damage repairs to the freighter Samoa on a bid of $55,285. The vessel struck the jetty at the entrance to Tillamook Bay and damaged 74 bottom plates as well as frames. The vessel's bottom from end to end is reported to be damaged.

Other bids submitted were: Moore Dry Dock Co., $75,980; Smith & Valley Iron Works, $72,300; Albina Engine & Machine Works, $72,014; Robert McIntosh, $70,560; and Albina Marine Iron Works, $62,000.

Todd Dry Docks, Inc., Seattle, Washington, has been awarded one of the largest repair contracts given to a Pacific Coast yard in recent months. This is damage repairs to the Blue Star Line's steamer Albionstar, which went on the rocks on Rosedale Reef, British Columbia, last month. Between 80 and 90 hull plates were damaged, and the repairs will cost in excess of $100,000.

This yard has also received contract for bottom damage repairs to steamship Alaska of the Alaska Steamship Company, which struck on a reef in Wrangell Narrows recently. Twenty-five plates will be repaired.

The Robins yard of the **Todd Shipyards Corporation,** Brooklyn, New York, was low bidder recently for reconditioning of the liner Ponce of the Porto Rico Line, which sank while in the Fletcher yard in Hoboken two months ago. Bids were:

Robins Dry Dock & Repair Co., $183,000; Tietjen & Lang Dry Dock Co., $196,260; W. & A. Fletcher Co., $219,500; Morse Dry Dock & Repair Co., $235,370; N. Y. Harbor Dry Dock Co., $253,481; Jas. Shewan & Sons Co., $239,736; Staten Island Shipbuilding Co., $242,019.

The Shipping Board has accepted the bid of the Union Steamship Co. for the purchase of 45 surplus vessels. The opening revealed varying offers ranging from proposals to buy three of the vessels for operation as steamers to buying all of them for scrapping. The invitation for bids permitted the receipt of offers for scrapping abroad as well as in American yards, although in the event it was proposed to recondition the vessels for operation as steamers it was prescribed that work should be done in American shipyards.

The bids received were as follows:

Union Shipbuilding Company, Baltimore, Maryland: An offer to purchase all 45 of the ships for the sum of $423,600.00, with agreement to scrap them within 18 months of award of contract.

Boston Iron & Metal Company, Baltimore, Maryland. An offer to buy all or none of the vessels for the sum of $686,250.00, with the stipulation that the purchaser be permitted to recondition the vessels for operation as steamers.

Thomas Ward, Ltd., Sheffield, England: An offer to buy all 45 of the vessels for the sum of £155,200 (approximately $750,000) for scrapping purposes with the understanding that the vessels be delivered to the purchaser in England.

Richard Nathan, Frankfort-on-the-Main, Germany, represented by J. Adler, Jr., of New York: An offer of $405,550 for the 45 vessels for scrapping, individual prices for the ships ranging from $6500 to $11,150 per ship. The vessels would be delivered at their present locations.

Schweitzer & Oppler, Berlin, Germany, bids submitted by Otto Dresdner, New York: An offer to buy from 1 to 15 of the vessels for scrapping at prices ranging from $7580 to $11,310 with the stipulation that on delivery of the vessels at their present locations, the purchasers would be entitled to carry one cargo to Europe either under their own steam or in tow.

Gulf Pacific Line, San Francisco: An offer to buy three vessels for operation on the regular Gulf-Pacific service of the line for the total sum of $56,000.

N. Block & Company, Norfolk, Virginia: An offer to buy 5 of the vessels located in Norfolk for the sum of $5391 each, the vessels to be scrapped.

John L. Sullivan, New York: An offer to buy the steamship Noddle Island, laid up at Orange, Texas, for the sum of $9600. The offer provides that one load of scrap steel be taken to Italy, prior to scrapping the vessel.

Sale of the steamships West Ira and West Ivis to the Pacific Argentine Brazil Line, headquarters at San Francisco, was approved by the Shipping Board December 11. Sale of the vessels was for the consideration of $50,364.25 and $50,404.50 respectively under the same terms and conditions as those governing the sale of the line to its present owners. The purchaser agrees to increase the service of its line from ten to fourteen guaranteed round voyages a year, and also to increase by one year the period of guaranteed operation.

The vessels are oil burning steel cargo ships of 8759 deadweight tons each. The purchaser will take delivery at New Orleans upon completion of repairs.

The Canadian National Steamships of Vancouver, B.C., is planning to operate two new passenger liners between Vancouver and Seattle. The vessels will be built in England and will be ready for service in 1930.

The Ferry Dock Company, Seattle, has been incorporated by Captain John L. Anderson, president of the Kitsap County Ferry Company, Philip D. McBride, and Captain Edward Lovejoy. The company has taken a 10-year lease on the Grand Trunk Dock and will alter the dock at an expense of $75,000 to make of it the largest ferry terminal in Seattle.

R. M. Bunten has opened new and fully equipped engineering and machine shops on the East Waterway, Seattle, to handle marine repairs and general work.

The McCormick Steamship Company of San Francisco was awarded contract for the carriage of ocean mails for its Pacific-Argentine-Brazil Line from San Francisco and Los Angeles to Buenos Aires and Bahia Blanca. The range of prices was $2.37 to $4.00, depending on the class of vessels employed.

KEEL LAYINGS

Delta Standard, oil tank barge for Standard Oil (Calif.) by Bethlehem Shipbuilding Corp., San Francisco, Oct. 30.

Paragon, steel diesel yacht by Bath Iron Works, Dec. 3; Hi-Es-Maro, steel diesel yacht for Henry J. Gielow, Inc., Nov. 14.

Single screw package freighter for Canada Steamship Lines by Midland Barge Co., Dec. 4.

Deck barge by Nashville Bridge Co., Oct. 10.

Tom Stellings, snag boat for Memphis River and Harbor District by Chas. Ward Engineering Works, Nov. 27.

DELIVERIES

Six standard Mississippi River Comm. barges by American Bridge Co., during Nov.

Holy Cross, diesel trawler to Atlantic & Pacific Fish Co., Boston, Nov. 27.

Virginia Lee, steel passenger and freight steamship to Pennsylvania Railroad Co. by Bethlehem Shipbuilding Corp., in Oct.

Steel derrick barge to Merritt, Chapman & Scott Corp., by Dravo Contracting Co.; two steel snag barges to U.S. Engineers; oil barge to Atlantic Gulf & Pacific Co.; 5 steel hopper barges to Union Barge Line; 9 standard Mississippi River Comm. barges to Memphis, all during Nov.

Six oil barges to International Petroleum Co. by Midland Barge Co., in Nov.

Virginia, express passenger and freight steamer to Panama Pacific Line by Newport News Shipbuilding & Drydock Co., Nov. 26.

P.R.R. No. 17 and L.I.R.R. No. 1, two harbor tug hulls to Pennsylvania Railroad by The Pusey and Jones Corp., Nov. 10.

General Charles F. Humphrey, double-end ferryboat to U.S. Quartermaster Corps., New York, by The Spear Engineers, Inc., Sept. 28.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of December 1, 1928.

Pacific Coast

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length over-all; 30' beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28 est.

Hull No. 113, lightship, sister to above; keel Sept. 1/28 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BALLARD MARINE RAILWAY COMPANY,
Seattle, Washington

Mikimiki, hull J 91, tugboat for Young Brothers, Ltd., Honolulu; 115 L.B.P.; 28 beam; 12 draft; 11 knots speed; 1040 Fairbanks-Morse diesel engs.; keel Sept. 12/28.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT
Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Hualalai, hull 5336, passenger and freight steamer for Inter-Island Steam Navigation Co., Honolulu; 295 L.B.P.; 27'6" beam; 17'6" loaded draft; 15 knots speed; 1200 D.W.T.; steam turbines; 4000 S.H.P.; 4 W.T. boilers; keel Dec. 27/28 est.

Delta Standard, hull 5337, steel tank barge for Standard Oil Co. (Calif.), San Francisco; 100 L.B.P.; 23'5" beam; 5'0" loaded draft; 2 gas engines; 100-125 B.H.P. each; **keel Oct. 30/28.**

Humuula, hull 5338, steel passenger and freight steamer for Inter-Island Steam Navigation Company, Honolulu, 1100 Gr. tons.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A. Wanner.

Hull 19, tow barge for Standard Oil Co. (Calif.), San Francisco; 72 L.B.P.; 24' beam; 4' loaded draft; 100 D.W.T.

Not named, hull 20, fishing boat for A. Paladini, Inc., San Francisco; 65' L.O.A.; 16 beam; 6 loaded draft; 125 H.P. 5-cyl. Union diesel eng.; keel Oct. 19/28.

J. C. JOHNSON'S SHIPYARD
Port Blakley, Wash.

Scow same as above, launched Aug. 13/28.

One scow for Salmon Bay Sand & Gravel Co., Seattle; 100x36x10 ft.

THE MOORE DRY DOCK CO.
Oakland, California.

Purchasing Agent: N. Levy.

One steel carfloat for Atchison, Topeka & Santa Fe Railway, San Francisco; 260 L.O.A.; 38' beam over all; 12'6" depth midships; capacity 14 80-ton cars; launch Oct. 10/28 est.; deliver Nov. 10/28 est.

One steel clam shell dredger for Board of State Harbor Commissioners, San Francisco; 90 x 41 x 12'9"; launch Oct. 10/28 est.; deliver Nov. 30/28 est.

Not named, one steel, screw double-ended diesel-electric automobile ferryboat for San Diego and Coronado Ferry Co.; 190 L.O.A.; 43'6" breadth of hull at deck; 60' breadth over guards; 14'9" depth at sides, molded; 8'11" light draft, molded; keel Dec. 20/28 est.; deliver Apr. 20/29 est.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

One steel car barge for Canadian National Railways, Vancouver, B.C.; 270 x 42 x 12' depth; keel Sept. 12/28; deliver Jan 10/29 est.

Wooden tug for John Currie & Son; 40 x 12 x 6 ft.; keel Oct. 1/28.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement, keel July 4/28; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Thirty Mississippi River Commission barges for: 120x30x7'; **6 delivered.**

One acid barge for American Steel Wire Co.; 100x26x7 ft.

Two barges for Anderson Tully Co., Memphis; 160 x 34 x 7 ft.

Twelve barges for Crucible Fuel Co., Pittsburgh; 175 x 26 x 11 ft.

BATH IRON WORKS
Bath, Maine

Holy Cross, hull 120, single screw steel diesel trawler for Atlantic & Pacific Fish Co., Boston; 123'x23'x14'; 400 B.H.P. Fairbanks-Morse diesel engine. Bath Iron Works design. Keel June 14/28; **launched Nov. 24/28; delivered Nov. 27/28.**

Georgetown, hull 121, trawler, same as above; keel June 14/28; launch Dec. 15/28 est.; deliver Dec. 18/28 est.

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer; **keel Dec. 3/28;** launch Apr. 10/29 est.; deliver May 1/29 est.

Hi-Es-Maro, hull 123, twin screw steel diesel yacht, Henry J. Gielow, Inc., New York, designer; 266'x35'x22' depth; 14'6" draft; two 1200 B.H.P. Bessemer diesel engs.; **keel Nov. 14/28.**

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Chelon, diesel-elec. cutter for U.S. Coast Guard Service; 250x42x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.; launched May 19/28; deliver Aug. /28 est.

Tahoe No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Virginia Lee, hull 1418, steel passenger and freight steamship for the Pennsylvania Railroad Co., West Philadelphia; 300 ft. length; TE engs.; **delivered Oct. /28.**

Not named, hull 1419, steel trawler for Mass. Trawling Co.; 116 ft. long; 460 gro. tons.

Not named, hull 1420, sister to above.

Hull 1421, boat for R. O'Brien & Co.; 230 gr. tons.

Not named, Hull 1422, single-screw coal collier for Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Not named, hull H-1424, steel passenger and freight steamer for New England Steamship Co., 1800 gro. tons.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; keel Dec. 20/28 est.

No. 116, same as above; Jan. /29 est.

No. 117, same as above; keel May 1/29 est.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2921, 106-ft. cruiser for L. M. Wainwright, Indianapolis; 2 Speedway diesels, 300 H.P. ea. at 700 r.p.m., wt. 7500 lbs.; deliver May/29 est.

Hull 2923, 66-ft. cruiser for J. McMillan, Detroit, Mich.; 2 170-H.P. Speedway engs.; deliver May /29 est.

Not named, hull 2925, 64-ft. cruiser for Rear Admiral L. M. Josepthals, New York; 2 170-H.P. Speedway engs.; deliver May/29 est.

Not named, hull 2926, 76-ft. cruiser for Adolph M. Dick, New York; 2 300-H.P. Speedway engs.; deliver June /29 est.

Not named, hull 2927, 35-ft. fishing boat for Leon Goodman, Philadelphia; two 44-H.P. Speedway engs.; deliver June 1/29 est.

Hull 2928, 21-ft. coupe yacht tender for Arthur Wheeler, New York; 1-22-H.P. Speedway; deliver May 1/29 est.

Hull 1929, 16-ft. yacht tender for above; 1 Universal eng.

Not named, hull 2930, 106-ft. cruiser for W. C. Robinson, Pittsburgh; 2 Speedway diesel engs.; deliver May 15/29 est.

Hull 2931, 16-ft. yacht tender for above; 1 Universal eng.

Not named, hull 2932, 50-ft. fishing boat for Caleb S. Bragg, New York; 2 170-H.P. Speedway engs.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Barbett, hull 130, wood yacht for C. A. Caryell, Bay City; 90 L.B.P.; 17 beam; 4 loaded draft; 12 mi. loaded speed; 75 D.W.T.; 200 I.H.P. diesel eng.; keel June 20/28; launched Nov. 1/28; deliver Nov. 15/28 est.

Not named, hull 131, steel yacht, owner not named; 105 L.B.P.; 17 beam; 6 loaded draft; 14 mil. loaded speed; 110 D.W.T.; 250 H.P. diesel eng.; keel Aug. 1/28; launch Nov. 1/28 est.; deliver June 1/29 est.

Not named, hull 132, wood yacht for C. W. Bonbright, Flint, Mich.; 61 L.B.P.; 13 beam; 4 loaded draft; 18 m.p.h.; 300 I.H.P. gas eng.; keel Oct. 15/28; launch Apr. 15/29 est.; deliver May 1/29 est.

DRAVO CONTRACTING COMPANY,
Pittsburgh, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'6" x 26'6" x 5' 6".

Hulls 691-694 inc. four steel carfloats for New York Central Railroad Co.; 270x38 x10'5"; 850 gro. tons ea.; **one delivered.**

Hulls 722-23, 2 standard steel barges for stock; 130'x30'x7'6"; 250 gr. tons **ea.**

Hulls 753-784 inc., 32 standard Mississippi River Comm. barges for Memphis office; **9 delivered.**

Hulls 787, 788, two steel house barges for Merchants and Miners Transp. Co.; 120 x 30 x 7 ft.

Hulls 789, 790, 791, three standard barges for Ohio River Sand Co., Louisville, Ky.; 130 x 30 x 7'6".

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 104, oil barge for Oil Transfer Corp., 175x35x12'5"; keel Oct. 16/28.

Hull 105, oil barge for above; 146x34'8" x10'2¼".

Hull 106, lighter hull for J. W. Sullivan Co.; 121x32'6"x13'4½"; **keel Nov. 15/28.**

Hull 107, welded steel barge for Boston Molasses Co.; 60x20'4¾"x7'6".

Hull 108, same as above.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hulls 1656-7, two barges for Mississipi River Comm., New Orleans, 120x30x7'6"; **keels Oct. 15 and 29/28; launched Dec. 3/28.**

Porterfield, hull 1658, towboat for U.S. Engineers Dept., Vicksburg, Miss.; 64'10"x Engineers Dept., Vicksburg, Miss.; 64'10"x 18'x3'10"; 100 H.P. diesel eng.; **keel Oct. 16/28; launched Nov. 22/28.**

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 244, diesel-electric dipper dredge for Great Lakes Dredge & Dock Co.. 156 L.B.P.; 43 beam; 10 ft. draft aft; keel Aug. 30/28; launch Jan. 1/29 est; deliver June 1/29 est.

MARIETTA MANUFACTURING COMPANY
Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Hull 234, sternwheel oil barge for Tropical Oil Co.; 203'x44'x5'6"; Marietta tamden comp. eng. 14"x28"x84"; keel July 18/28; deliver Nov. 15/28 est.

Hull 235, sister to above; keel Aug. 1/28; deliver Dec. 15/28 est.

MIDLAND BARGE COMPANY
Midland, Pa.

One dredge hull for M. H. Treadwell Co. of New York; 150'x70'x13'6".

Three fuel barges for Union Barge Line Corp., Pittsburgh; 100x24x8 ft.

Four line barges for U.S.A. Engineers, Vicksburgh.
Four barges for Pittsburgh Plate Glass Co., Pittsburgh; 135x26x10 ft.

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.
Not named, hull 23, single screw package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42'9" beam; 14' loaded draft; 12 mi. speed; 2200 D.W.T.; TE steam engs.; 1300 I.H.P.; 2 Scotch boilers, 14'6" dia. x 11' long; keel Dec. 4/28; launch Apr. 1/29 est.; deliver May 1/29 est.
Midland Prince, converted to self-unloader.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.
Hull 149, towboat for Standard Unit Nav. Co.; 92x24x5 ft.; keel May 10/28; launch Jan. 1/29 est.
Hull 161, ferry hull for stock; 150 L. B.P.; 62 beam; 8 loaded draft; keel Sept. 16/28; launch Feb. 10/29 est.
Not named, hull 163, ferryboat for Davidson County, Tenn.; 60 L.B.P.; 16 beam; 3 loaded draft; keel Oct. 15/28; launch Dec. 15/28 est.
Hull 164, deck barge for stock; 120x 30x7 ft.; keel Sept. 28/28; launched.
Hull 165, same as above; keel Oct. 10/28.
Hull 166, dredge for stock; 80 L.B.P.; 36 beam; 6 loaded draft; keel Nov. 15/28 est.
Hull 167, deck barge for stock; 110 x 28 x 7'3"; keel Dec. 15/28 est.
Hull 168, deck barge for stock; 110 x 28 x 7'3"; keel Dec. 15/28 est.
W. W. Fischer. hull 169, diesel towboat for Central Sand Co.; 120x26x5½ ft.; 720 I.H.P.
Hull 170, deck barge, 100x28x7¼ ft.
Hull 171, deck barge, 100x24x5 ft.
Hull 172, same as above.
Hull 173, deck barge, 100x26x6½ ft.
Hull 174, same as above.
Hull 175, ferryboat, 60x18x2¼ ft.
Hull 176, barge, 100x26x6½ ft.
Hull 177, tug, 50x12 ft.; 150 H P.
Hull 178, dredge, 100x36x8 ft.
Hulls 179-183 inc., 5 barges, 120x30x 7 ft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.
Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.
Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.
Virginia, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27; launched Aug. 18/28; delivered Nov. 26/28.
Not named, hull 329, sister to above; keel Oct. 15/28.
Viking, hull 328, steel yacht for Geo. F. Baker, Jr., 272'1" L.O.A.; 36'6¾" beam; 18'6" depth; two turbine driven G.E. motors; 2 Babcock & Wilcox WT boilers; 1200 gross tons; 2600 S.H.P.; keel July 3/28; launch Dec. 15/28 est.; deliver Apr. /29 est.
President Johnson, ex-Manchuria, hull 330, reconditioning for Dollar Steamship Co., San Francisco.
City of Elwood, hull 331, diesel conversion for U.S. Shipping Board.
Ward, hull 332, diesel conversion for U.S. Shipping Board.

NEW YORK SHIPBUILDING CO.
Camden, N. J.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.
Chester, light cruiser CL- 27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.
Hull 378, steam lighter for Pennsylvania Railroad Co.; keel Sept. 1/28; launched Nov. 28/28; deliver Dec. /28 est.
Not named, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'8" beam; 37' 5" depth; General Electric turbo-electric machinery; keel Feb. 15/29 est.

THE PUSEY & JONES CORP.,
Wilmington, Del.

Purchasing Agent: James Bradford.
P.R.R. No. 17 and L.I.R.R. No. 1, hulls 1037, two harbor tug hulls for Pennsylvania Railroad Co.; 105' L.O.A.; 24' beam; 13'9" molded depth; keels July 12/28; launched one Oct. 15/28; launched one Oct. 27/28; delivered Nov. 10/28.
Not named, hull 1038, twin screw diesel yacht for Arthur E. Wheeler, New York; 126 L.O.A.; 21'6" beam; 8'6" app. loaded draft; 2 250-B.H.P. diesel engs.; keel Oct. 18/28; deliver April 15/29 est.
Not named, hull 1039, oil tanker for

Tide Water Oil Co.: 225 L.B.P.: 44 beam: 15'6" loaded draft: 10½ knots speed; 2300 D.W.T.; diesel electric power; 1000 L.H.P.

Not named, hull 1040, yacht for Fred J. Fisher, Detroit, 236 L.O.A.; 34 beam; 19 lepth, 2 1100 H.P. diesel engs.

Not named, hull 1041, yacht for Alfred P. Sloan, Jr., New York; same as above.

Not named, hull 1042, yacht for owner not named, same as above.

THE SPEAR ENGINEERS, INC.,
Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

General Charles F. Humphrey, hull 1, screw double-end ferryboat for Quartermasters Corp., U.S.A.; 99' L.B.P.; 44' beam; 9'6" loaded draft; 10½ mi. speed; 600 D.W.T.; Fairbanks-Morse direct diesel drive; 450 I.H.P. eng.; keel July 13/27; launched June 16/28; **delivered Sept. 28/28.**

John M. Dennis, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.: 198' L.B.P.: 60' beam: 90'0" loaded draft: 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450-I.H.P. engs.; keel Feb. 18/28; **launched Dec. 15/28.**

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.: 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor, keel Aug. 18/28.

Not named, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P.

SPEDDEN SHIPBUILDING CO.
Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Charles E. Evans, hull 264, fire and patrol boat for Commissioners, Washington, D.C.; 55' L.O.A.; 11'9" molded beam; 6'9" molded depth; 5' loaded draft; 31 D.W.T.; 100 H.P. Standard diesel eng.; keel Aug. 25/28, **launched Nov 22/28;** delivered Feb. 1/29 est.

Not named, hull 265, steel hull, steam driven, patrol vessel for Sepervisors of New York Harbor, 39 Whitehall Street, New York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam, 10'1½" mean draft; T. E. engs.; Babcock & Wilcox W.T. boilers.

STATEN ISLAND SHIPBUILDING CO.,
Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Not named, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel July 2/28.

Hull 782, barge for Grasselli Chemical Co.: 150 x 38 x 12'6".

SUN SHIPBUILDING COMPANY,
Chester, Penn.

Purchasing Agent: H. W. Scott.

Not named, hull 116, passenger and freight motorship for American South African Line, Inc., New York; 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs.

Not named, hull 117, tanker for Sun Oil Co.; 245 L.B.P.; 43 beam; 15'6" loaded draft; 8 knots speed; 2300 Bessemer diesel engs.

TODD DRYDOCK, ENGINEERING & REPAIR CORP.,
Brooklyn, N.Y.

Purchasing Agent H. J. Shannan.

Not named, hull 45, steel double-end ferryboat for City of New York, Dept. of Plant and Structure; 151 L.O.A.; 53 beam over guards; 37'6" molded beam; depth to top of beams 14'3"; draft 8'3"; steam engs.; keel Nov. 1/28.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Dwight W. Davis, hull 69, steam propelled towing boat for Inland Waterways Corp., Washington, D.C.; 140x25x9 ft.; 2 500-H.P. Nordberg engs.; equipped to burn powdered coal, keel July 23/28.

Captain George, hull 73, single screw tugboat for U. S. Engineer Office, Galveston; 65'6"x17'x7'7½"; 190 B.H.P. Winton diesel eng.; **keel Oct. 16/28.**

Tom Stellings, 74, Western river type, steam driven 30-ton snag boat for Memphis River and Harbor District, U.S. Army engineers; 127'x30'x4'4"; **keel Nov. 27/28.**

Major, hull 75, stern-wheel towboat for stock; 64'9"x18'x4'5"; diesel eng.; keel Oct. 12/28; **launched Nov. 21/28;** deliver Dec. 15/28 est.

Not named, hull 76, sister to above.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD., Union Plant

Dock, clean, paint, misc. repairs: sch. Nome City (also furnish 1 new rudder stock), stmrs. Frank D. Stout, John C. Kirkpatrick, boat Hoquiam, barge Haviside No. 4, two barges for Calif. Bridge & Tunnel Co., tug Oregon, Humboldt, stmrs. Caspar, McKittrick, El Segundo, Maui, U.S.S. Saratoga, U.S.S. Arizona, U.S.S. Maryland, m.s. General, Hawaiian Standard, Indria, tug Morgan Shell, barge Martinez. Pipe repairs: Point Reyes, m.s. Sommerstad, Willbabco, Point Sur, Petricola. Repairs to port anchor: Missoula. Make and install 5 sets metallic pressure breakers: Argyll. Make and install 2 new airports, Nordanger. Propeller repairs: Sylvan Arrow, ferry Redwood Empire, Missourian, tug Arabs. Make and install port light frames, Ruth Alexander. Anchor repairs: Levant Arrow. Make and install No. 3 cargo boom: Cubore. Engine repairs: San Leonardo, launch Pablo, m.s. Bulimouth, H. F. Alexander. Misc. repairs: Leikanger, Varanger, Missoula, Trinidad, Silverfir, Sea Rover, City of Honolulu, Santa Maria, Argyll, Deroche, Dorothy Wintermote, Hallanger, Silverspruce, El Grillo, West Katan, San Felix, Emma H. Coppage, Garbage boat Tahoe, stmr. John C. Kirkpatrick, schrs Necanium, Hartwood, Santa Inez, tug F. A. Douty, H. F. Alexander, Point Fermin, Waihemo, Esparta, Tacoma, Alvarado, Point Judith, Tudorstar, La Perla, ferry Eureka, Point Montara, Kekoskee, San Jose, Mongolia, Malolo, Nevada, Makura, Limon, Point Sur, Beulah.

U. S. NAVY YARD,
Bremerton Wash.

Misc. repairs and docking: Colorado, Cuyama, Farquahar, Thompson, Decatur, Moody, Zeilin. Misc. repairs: Saratoga. Misc. repairs incidental to operation as district craft: Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.

Who did What - - and How

The steamer Golden West, operated by the Oceanic and Oriental Navigation Company, sailed from San Francisco December 11th. She made a stop at San Pedro, from whence she sailed to Australia. Before leaving San Francisco her tanks were filled with Shell Marine Oils.

The chief engineer, P. F. Blinn, has a great deal of praise for the fine quality of Shell Marine Oils, and reports everything functioning perfectly.

As soon as the steamer Rhine Maru docked at San Francisco in November, Chief Engineer Mohr put in a call for Shell Turbine Oils. This steamer is driven by a Brown Curtis impulse turbine with double reduction gearing. Mr. Mohr has been on this steamer for several years and gives his opinion that Shell Turbine Oil is [illegible] and gives perfect satisfaction. The Rhine Maru is one of eleven steamers in the Kawasaki North Express Service and is operated by the Kawasaki Kisen Kaisha located at Kobe, Japan.

The Shell offices in Honolulu have received a letter from the General Manager of the Inter-Island Steam Navigation Company, Ltd., which makes very interesting reading:

"Your turbine oil in use in the main turbines and Westinghouse auxiliaries on our steamer Waialeale is doing excellent work.

Up to the present writing, the steamer has been in operation from June 4th to November 9th with no additional replenishment in the system of main unit.

Everyone in the engine department is perfectly satisfied."

November 16th the steamer President Monroe sailed from San Francisco on another round-the-world voyage. She left here with a capacity cargo and a full list of passengers. Before she sailed she was filled with Shell Marine Oils. The first assistant, J. C. Smith, states that on her last trip she used less oil than ever before, which may be attributed to the efficiency of the oilers and quality of oil used.

William D. Schoning, chief engineer, is going to take a shore position and was relieved by K. C. Stubo, who has been sailing on the S.S. President Cleveland during the past seven years.

Joseph Barker, who recently retired after 25 years service with the Matson Navigation Company, and who served as port engineer for more than ten years has repaired to a chicken ranch near Napa.

However, Joe is to be seen at least once every two weeks along the San Francisco waterfront. "Just have to come down for a breath of salt air and the smell and atmosphere of the engine room," vouchsafed Chief Barker. He is one of the best known and popular maritime figures along the waterfront.

Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

Electrical propulsion will be one of the vital factors in the rebuilding of the American merchant marine, according to **W. C. Watson** and **J. L. Roberts**, trial engineers of the General Electric Company. Virtually all of the fast passenger liners building or contemplated for offshore operation under the Jones-White act are to have turbo-electric drive, the engineers pointed out. Success of the liners thus propelled has opened the eyes of the shipping world to the accomplishments of the California. The Panama-Pacific Line has met with further success in the trials of the Virginia, and is building a third liner, with three more under consideration. W. R. Grace and Company has let contract for a large vessel, and the Dollar Line may adopt that mode of propulsion in its new 20,000 tonners, the engineers declared.

Legislation is now pending for the participation of the United States in the international conference of maritime powers to be held in London next spring. A codification of international sea laws designed to make sea travel more safe will be one of the important matters to be submitted to members of the conference.

Thomas J. Kehoe, general eastern agent for the American Mail Line, was a recent visitor in San Francisco. He conferred with officials of the Dollar Steamship company while here. He is well known on the Pacific Coast, where he was situated prior to transfer east.

The former Shipping Board vessels Mursa, Heber, Mohinkis, Diablo, and Fort Wayne, sold to private interests, were taken from Benicia to the plant of the General Engineering and Drydock Company in Oakland for reconditioning. This leaves the Benicia flats free of Shipping Board hulls.

Heinz Arens, former assistant at San Francisco to **Paul Nolze**, manager of the North German Lloyd's North Pacific service, is en route to Valparaiso on the Justin of the Hamburg-American Line. Arens will take an important position with the firm in South America.

James King Steele, advertising manager and general director of public relations of the Nippon Yusen Kaisha, has returned to his home in San Francisco after an absence of four months. Steele visited Japan and China and attended the coronation ceremony in Japan. He said that the motor liners building for the N.Y.K. are up to construction schedule and will be in readiness for service early next fall.

The painting "Ships That Pass in the Night," by the noted marine artist W. A. Coulter, has been purchased by **Roger D. Lapham**, president of the **American-Hawaiian Steamship Company.**

Vessels of the **Nelson Steamship Company** loading westbound at Baltimore will now dock at the Pennsylvania Railroad, Canton terminal, each Monday, according to announcement made by **A. J. Houda**, freight traffic manager of the company. This docking will be in addition to regular call at the Baltimore & Ohio Railroad Locust Point Terminal. The new schedule affords a direct connection with the "Pennsy," and gives them a preferred position with the Baltimore industries situated closer to the Canton terminal.

Robert Corry, director of the **Commonwealth & Dominion Line,** recently stated that while ship op-

Chief Engineer Harry Peterson in a characteristic pose at the controls of his diesel engine on the Panama Mail motorship City of Panama.

erators were puzzled over the best means of propulsion, that his company was entirely satisfied with the trial runs of the new motorship Port Fair, recently completed on the Tyne. The Port Fair and her sister ship, Port Alma, are being fitted for the Australian and New Zealand meat trade.

Plans for the inauguration of a Philippine inter-island service to act as feeder for transpacific and round-the-world vessels are being made by the **Dollar Steamship Company**, it has been announced. There is no regular inter-island service in the islands at present, although vessels under various flags call intermittently. **R. Stanley Dollar**, vice-president of the company, predicts a tremendous development of trade in the future.

For the fiscal year 1928, an operating loss of $465,308 was sustained by the **United States Lines**, according to a report made by the Shipping Board Merchant Fleet Corporation.

Norman F. Titus has resigned as chief of the transportation division of the United States Bureau of Foreign and Domestic Commerce to become manager of the New York-New Jersey Business Executives, Inc., located in Jersey City.

The organization has for its purpose the problem of solving the mounting costs for handling freight in and around New York harbor. Titus was formerly connected with the McCormick Steamship Company in San Francisco, and a valued contributor to Pacific Marine Review.

Commencing February 6, the steamer Wilhelmina will operate in the Puget Sound-Portland and Honolulu passenger and freight service of the **Matson Navigation Company.** The vessel has been overhauled and improvements have been made in all her cabins. Assignment of the Wilhelmina to this service is looked upon as indication that the company will add other liners as fast as the demands warrant.

Captain Theodore K. Oaks, former master of the motorship City of San Francisco, and who made one trip aboard the liner Ecuador, is remaining shoreside for the present assigned to the **Panama Mail** piers at San Francisco.

Cognizant of the severe strain on

H. F. Alexander, who has recently been reelected president of the Pacific Steamship Company.

transatlantic skippers, the **French Line** has instituted a relief system for its masters. Maurice Tillier, managing director of the company, announces that a relief master has been appointed to relieve skippers of the Ile de France, Paris, and France at stated intervals.

Announcement has been made that the **Nippon Yusen Kaisha's** Seattle offices will move on March 1 from the Colman Building to the

Commodore J. A. Trask, master of Matson Oceanic liner Sierra.

new Great Northern Building. Practically the entire fourth floor has been leased by the Japanese line from the Great Northern Railway Company.

Captain Clarke Woodward Sprague, veteran Puget Sound tugboat skipper, who for the past several years has been pilot for the Nippon Yusen Kaisha, passed away in Seattle after an illness of three months.

Need for additions to the force of the Steamboat Inspection Service in San Francisco has been stressed by **Dickerson N. Hoover**, supervising inspector-general, in a report to the Secretary of Commerce. Hoover stated that if the standard of inspection insisted upon by the Department is to be maintained, the cities of San Francisco, New Orleans, Baltimore, Boston, Portland, Me., Galveston, and some other ports will need additional personnel.

Since return of the **American-Hawaiian Steamship Company** to the intercoastal service in 1923 vessels of the line have transited the Panama Canal 1000 times, and have paid tolls of more than $5,400,000, according to **Rodger D. Lapham**, president.

A movement towards establishing a monument in memory of Samuel Plimsoll, originator of load line regulations, is under way in England and is being made the object of much publicity in the English papers, according to word received here.

William H. Everett, assistant manager of **Thomas Cook & Son**, died in London recently, according to advices received by friends here. He was widely known in shipping circles in this country, and is survived by a widow and two sons. He was with the firm for 45 years.

Harry S. Scott, president of the **General Steamship Corporation**, Pacific agents of the Libera line, in an address before shipping men at San Pedro said that this line would probably add two new vessels for passenger and freight transport to its European-Pacific Coast service.

Advices on the semi-annual meeting of officials of the **Nippon Yusen Kaisha** in Tokio show that a dividend of 8 per cent was declared on the recommendation of **T. Shirani**, president. In the report of the presi-

dent a net profit of 3,230,000 yen was shown for the first six months of the year ending September 30. The N.Y.K. has nine modern motorships under construction. Three of these are for the San Francisco-Orient line.

Savannah Lighthouse No. 1 has rounded out 75 years of service at Savannah. She was recently drydocked after 13 months at "station" off the Georgia coast. The vessel is declared to be as staunch and seaworthy as ever, despite the severe pounding received in a storm recently off the Georgia coast.

E. L. "Daddy" Hawes, dean of the stewards of offshore vessels, is celebrating his fifty-second year at sea. The veteran is with the **Dollar Steamship Company** and attached to the President Harrison. Hawes embarked as an adventure fifty-two years ago on the bark Pride, which was making its first cruise of the Pacific. The adventure "took," and Hawes' record now shows 348 trips across the Pacific and 11 trips around the world.

The **Shipping Board** will continue its program for disposing of vessels to private operators as fast as responsible purchasers can be found, Chairman T. V. O'Connor announces. O'Connor declared that the Board had sold 1600 vessels since the end of the World War, and added that it is the Board's intention to dispose of several lines during the coming year, to include the United States lines. He also declared that about thirty-five vessels would be built in American yards during the forthcoming year under the Jones-White act, which he predicted would herald a turning point in American maritime history.

In order to augment refrigerator and general cargo service to the Pacific Coast, the **Blue Star Line,** through **E. A. Gilbert,** United States manager, announces a schedule of sailings between fruit seasons, from April 1 to October 1. The line is represented in San Francisco and Los Angeles by the **Dollar Steamship Company.**

Plans for the construction of a $2,000,000 cold storage terminal on the San Francisco waterfront was given further impetus when the California Pear Growers' Association passed a resolution supporting the measure. Frank P. Swett, manager of the Association, explained that adequate facilities to handle California's fruit export was a necessary adjunct to the San Francisco waterfront. A copy of the resolution was forwarded to Governor C. C. Young.

Chief Engineer R. Miyamoto of the N.Y.K. liner Korea Maru.

One of the best known Japanese engineers sailing the Pacific is **Rinzaburo Miyamoto,** chief engineer aboard the Nippon Yusen Kaisha's passenger liner Korea Maru, operating in the transpacific trade. He has been with the Nippon Yusen Kaisha for the last twenty-seven years.

Chief Engineer Miyamoto has been in practically every service of the company, and was at one time on the Miike Maru, which inaugurated the first regular Orient-Seattle service some thirty-two years ago. While chief aboard the Shinyo Maru he cut the vessel's fuel consumption 20 per cent and increased the speed of the liner two knots an hour.

The chief pays tribute to American shipbuilders, saying that the Korea Maru, formerly the Pacific Mail liner Korea, is a fine ship, fuel consumption is low, speed is good, and she is a wonderful sea boat.

Captain James Roberts, master of the Panama Pacific liner California.

Unconfirmed reports state that the **Bruusgaard Line,** a Norwegian company, now operating one ship in the Pacific trade, plans the construction of a fleet of fast new motor liners for the Pacific.

L. J. Roberts and **W. C. Watson,** trial engineers of the **General Electric Company,** following their return after being observers during the record run of the U.S.S. aircraft carrier Lexington, declared that electric drive propulsion will play an important part in the development of the American merchant marine. The officials were aboard the Lexington when she developed 209,751 horsepower, and a speed of 34.82 knots per hour.

Faster service between Mediterranean and Pacific Coast ports through the elimination of certain calls on the westbound voyage has been arranged by the vessels of the **Libera Line.** This announcement was made by **Harry S. Scott,** president of the **General Steamship Corporation,** Pacific Coast agents. The first vessel to curtail ports of call westbound was the motorship Leme, which has just arrived here.

The maritime interests of Seattle will be centered in the Merchants Exchange building, work on which has been started. The new structure, to be one of the finest in Seattle, will be eighteen stories in height.

The steamship Margaret Dollar is under the direction of **Captain Alex Stinson,** during the vacation of **Captain H. T. Paine,** widely-known Pacific Coast skipper. Captain Paine will return to the command of the American Mail Line steamer next month. Captain Stinson has

been in command of the Montana. Captain F. W. Brooks is skipper of the Montana until Captain Stinson's return.

Captain H. Z. Howard, who passed away in San Francisco last month, and who was head of the Pilot Commissioners at this port, was the oldest mariner on the Pacific Coast, and one of the oldest in the world. He was approaching the age of 94, when the Master Mariner beckoned. Captain Howard was known in many ports of the world and was a well-known figure for fifty years in maritime activities on the Pacific Coast. He was hale and hearty to the last, attending a meeting of the Pilot Commission a few days prior to his death.

A. E. Clegg, president of the **Kerr Steamship Company, Inc.**, after his recent tour of the Pacific Coast, announced that contracts had been let for construction of three motor freighters for the trade. This additional tonnage will give 17 "Silver" vessels of approximately 150,000 tons total deadweight capacity in the Kerr Line operating out of Pacific Coast ports in the round-the-world and Pacific-Java-Calcutta services.

The new ships will be equipped with circulation cold air refrigeration for 1500 tons of perishables each. They will be twin screw, 9000 tons deadweight, with a service speed of 14.05 knots. The vessels are expected to be ready for service in November of this year, according to President Clegg.

Harold Brinkhoff, well-known in maritime circles, was appointed first assistant engineer of the **Panama Mail** liner Ecuador by Chief Engineer James Smith before the vessel sailed on her last voyage eastbound.

Joseph Sume, formerly second engineer on the Ecuador, went out in the same position aboard the steamer Corinto.

"Jack" Clements, port engineer for the **Pacific Steamship Company** at San Francisco, made the trip overland with Mrs. Clement from San Francisco to return on the maiden trip of the Panama-Pacific liner Virginia. Mr. Clements stated that this giant liner is the acme of perfection.

First of four new carriers building for the **French Line** for their European-Pacific Coast service to reach the Pacific Coast will be the steamer Wyoming in May of this year, according to **Drew Chidester**, vice-president of the General Steamship Corporation. The second steamer will be christened Wisconsin. Two motorships to be named Oregon and Washington will complete this quartet of new ships.

Captain W. E. Bell of the Matson liner Sonoma with a pet wallabie.

The motorship Oregon, due here in October, will have aboard Maurice Tillier, director-general; and Pierre de Malglaive, general manager in the United States and Canada. The General Steamship Corporation is Pacific Coast agent for the service.

Each vessel will have a speed of 14 knots fully laden, and will have a capacity for 40 passengers. The speed of the vessels will permit them to reach Continental ports in 26 days from the Pacific Coast.

Captain R. R. Drummond, widely-known transpacific master, has resigned from the services of the **Matson Navigation Company** as commander of the liner Sonoma. His resignation came as a surprise. He is succeeded by **Captain W. E. Bell**, who has been with the Matson Line for the last three years. Captain Bell was formerly with the **Los Angeles Steamship Company**.

Captain Drummond served for many years with the old Pacific Mail Steamship Company. Later he joined the old Oceanic Steamship Company and remained as commander of the Sonoma when the Matson interests bought out Spreckels.

Chief Engineer **D. C. Mitchell** of the Lurline served as head of the machinery department on the steamer Manoa during the period of vacation of **William McLennan. Captain E. R. Johanson**, skipper of the Manoa was relieved by **Captain R. H. Gillespie**, also of the Lurline, during the former's vacation, which has just ended.

Al S. Gunn, general manager of **Bethlehem Shipbuilding Corporation** at San Francisco, is back from a recent trip to the Atlantic Coast, where he inspected the steamer Mount Clay, recently purchased by the Pacific Steamship Company.

William P. Roth, president of the **Matson Navigation Company**, announces that **Commodore J. H. Trask**, skipper of the Sierra, will be on the bridge of the first of the two new $6,500,000 liners that will be ready within eighteen months for their San Francisco, South Seas, Australian trade.

Twenty-eight years ago Captain Trask came to San Francisco on the bridge of the Sierra as chief officer. He has been since that time continuously in the San Francisco, South Seas, Australian trade.

The American Mail Line, with headquarters at Seattle, has announced several changes of the personnel of the general freight department.

J. B. Armstrong, assistant general freight agent, who has had charge of transpacific freighters, President liners, and Blue Star ships, will devote his time to the Blue Star ships, to the transpacific freighters, and to the general freight offices.

H. T. Krull, who has been terminal agent for the American Mail Line at Pier 41, Smith Cove, has been promoted to assistant general freight agent in charge of the President liners.

L. C. Cherry, formerly claim agent for the American Mail Line, will succeed Mr. Krull.

J. H. McCormick of the claims department has succeeded Mr. Cherry. **L. L. Bates**, general freight agent, is general supervisor of the claims department.

These changes were made necessary by the increase in tonnage handled by this company and the increased sailings of the Blue Star Line.

Trade, Traffic, and Shipping

Progress in South America

(Continued from Page 16)

rapidly are things forging ahead. American banks are firmly entrenched there since the war, and American cars and manufactures are evidence of this country's rapid ascendancy in Latin trade.

The market for Douglas Fir is rapidly developing in Argentina, said Bybee, and large users of lumber are changing from Southern Pine to Douglas Fir specifications. The Central Railway of Argentina, one of the largest systems in the country, has changed all specifications for bridges, trestles, cars, etc., from pine to Douglas Fir, which will mean a tremendous impetus in the export of this commodity.

Cargo movement continues to improve on the McCormick Pacific Argentine Brazil Line, and Bybee said the company plans to enter more ships shortly, due in part to the new mail-carrying contract which has recently been concluded with the Post Office Department.

Freights, Charters, Sales

December 14, 1928.

THE following grain fixtures to the United Kingdom-Cont. are reported: Brit. str. Lavington Court, Portland to U.K.-Continent, Dec., Continental Grain Co.; a King str., Vancouver to Spanish ports, Mediterranean, 35/6, Dec., L. Dreyfus & Co.; a Smith str., Vancouver to Antwerp or Rotterdam, 31/-, opt. Hamburg 31/9, Feb., J. W. Mitchell, Ltd.; British str. Eastern City, Vancouver to U.K.-Cont., Dec., F. J. Heyward; British str. Homside, Vancouver to Adriatic, 34/9, Mar., Wm. H. Pim, Jr. Co.; British m.s. King Neptune, Portland to U. K.-Cont., Dec., Balfour, Guthrie & Co.; British str. Orangemoor, Portland or Puget Sound to U.K.-Continent, 24/6, opt. Cork, Dublin or Belfast discharge 25/-, Dec. Jan., Balfour, Guthrie & Co.; British str. Peterton, Vancouver to Antwerp or Rotterdam, 32/8, Dec., Earle, Stoddard & Clayton; British str. Willowpool, Vancouver to U.K.-Cont., Dec., James Stewart Grain Corp.; British str. Romaby, same; British str. Rossington Court, Vancouver to U.K.-Cont., Dec.; Danish str. Silkeborg, British Columbia to Port of Spain, Dec., Canadian Transport Co.; a Smith str., Vancouver to Antwerp or Rotterdam, 30/6, Hamburg 31/-, Mar. a steamer, Vancouver to U.K.-Continent, 31/6; opt. Antwerp or Rotterdam, 31/-, Jan./Feb., Canadian Cooperative Wheat Producers, Ltd.; a steamer, Vancouver to U. K.-Cont., 32/6, opt. Antwerp or Rotterdam, 32/-, Jan., same charterers; a British str., Vancouver to Antwerp or Rotterdam, 31/-, both ports 31/9, Hamburg 31/9, Feb.; a steamer, Vancouver to U.K.-Cont. 35/-, Dec.; a steamer, Vancouver to Antwerp or Rotterdam, 32/6, opt. Avonmouth 33/6, Hull or London 33/-, Jan.-Feb., Earle Stoddard & Clayton; British str. Norwich City, Vancouver to Antwerp or Rotterdam, 32/3, opt. Hamburg 32/9, Avonmouth, Liverpool or Hull, 33/-, Jan.; British str. Tre . . . , Vancouver to U.K.-Cont. 35/-, opt. Antwerp or Rotterdam, 34/6, Dec., J. Mitchell, Ltd.; a Smith str., Vancouver to Bordeaux-Hamburg range; London or Hull 33/-, opt. Antwerp or Rotterdam 32/6, Avonmouth 33/6, Jan./Feb., Eggar Forester & Parker; a str., Vancouver to U. K.-Cont. 33/9, opt. Antwerp or Rotterdam 33/3, Jan., Canadian American Shipping Co.; a str., Vancouver to Scandinavia, 38/6, Jan., Canadian Cooperative Wheat Producers, Ltd.; British str. Farnworth, same; British str. Homer City, Vancouver to London/Hull Hamburg, 34/3, Jan., same charterers; British str. Northmoor (new), same; British str. Anglo Australian, same, 33/9, Jan., Canadian American Shipping Co.; Japanese str. Glasgow Maru, Portland to U.K.-Cont., Dec., Continental Grain Co.; a British str., Vancouver to Antwerp or Rotterdam, 30/6, Hamburg 31/-, Mar.; a steamer, Vancouver to U.K.-Cont., 33/-, Antwerp or Rotterdam, 32/6, Dec. Jan.; British str. Quarrington Court, Vancouver to U. K.-Cont. 32/6, Antwerp or Rotterdam, 32/-, Jan.; Swedish str. Sydland, Vancouver to U.K.-Cont. 31/6, Antwerp or Rotterdam 31/-, Jan. Feb.; Japanese str., Vancouver to U.K.-Continent 32/6, Mar., Canadian Cooperative Wheat Producers, Ltd.; British str. Filleigh, Vancouver to U.K.-Cont. 33/-, Antwerp/Rotterdam, 32/6, Dec./Jan.; British str. Kelsomoor, Portland to Ireland, 35/9, Jan., Kerr Gifford & Co.

The British m.s. Alynbank is reported fixed from British Columbia to Australia, Dec. loading, by Canadian Trading Company, and the Norwegian m.s. Heina from Grays Harbor to Sydney, Dec. loading, by American Trading Co.

The following steamers are reported fixed with lumber to the Orient: Japanese str. Seisho Maru, North Pacific to two ports Japan, $9, Nov., J. W. Allen, Inc.; Japanese str., Tairyo Maru, Columbia River to Japan, Dec., Pacific Export Lumber Co.; American str. Haynie, North Pacific to Japan, $10, Dec., Douglas Fir Exploitation & Export Co.; American str. Havilah, North

Three jolly British officers of the Kerr Line Motorship Silverhazel in their whites.

Pacific to Japan, Dec., Hammond Lumber Co.; Japanese str. Heinan Maru, C. R. to Maigura, Nanao & Fushiki or Niigata, $10.25, Dec., Canadian Trading Co.

The American steamer Missoula is reported fixed from Eureka to La Union & San Jose de Guatemala with ties, prompt loading, by Hammond Lumber Co.

The following tanker fixtures are reported: British str. Lompoc, California to Yokohama, 62c, Dec./Jan.; a steamer, California to China, several voyages; American str. George H. Jones, California to North of Hatteras, 66c, Dec.; British m.s. Oilpioneer, California to Shanghai, 78c, Dec., several trips; American str. Lubrico, California to North of Hatteras, 65c, Dec.; American str. K. R. Kingsbury, same, clean; Norwegian m.s. Java, California to Japan, 45c, Dec.; Norwegian m.s. Lincoln Ellsworth, California to U. K.-Cont., 66c, end Dec.; American str. Agwihavre, California to North of Hatteras, 52c, first half Jan.; Norwegian m.s. Svolder, California to Bahia Blanca and Buenos Aires, 26/6, clean, Feb., 1/20 cancelling.

The following steamers are reported fixed on time charter: Japanese str. Ohkuni Maru, 6 months, Nov., Yamashita Shipping Co.; Italian m.s. Ansaldo San Giorgio Secondo, del. and redel. U.K.-Continent via North Pacific, Dec., W. L. Comyn & Co.; British str. Glenheath, del. Shanghai, redel. U. K.-Cont. via North Pacific, $1.20, Nov.; British str. Volumnia, Vancouver to Rotterdam, delivery Norfolk, wheat, $1.30, prompt, Canadian American Shipping Co.; Norwegian m.s. Tyr, Pacific trade, 6 months, delivery Marseilles, redel. U.K.-Cont., $1.50, Nov.; Norwegian m.s. Childar, round trip to Shanghai, del. Columbia River, Dec., redelivery San Francisco, J. J. Moore & Co., Inc.; American str. Georgian, B.C. to U.K., redel. North Atlantic, Dec., Canadian American Shipping Co.

The following steamers are reported sold: American str. West Harts, U. S. Shipping Board to States Steamship Co.; American str. West Hartland (to be renamed Michigan), same; American str. West Ira, $50,364 reported, United States Shipping Board to Pacific Argentine Brazil Line (McCormick Steamship Company); American str. West Ivis, $50,404 reported, U.S. Shipping Board to Pacific Argentine Brazil Line (McCormick S.S. Company).

PAGE BROTHERS, Brokers.

New Pacific-U. K. Service

In our December issue we called attention to arrival, loading, and departure of the British motor vessel East Lynn, giving a brief general description of the vessel. This visit marked the inauguration of the Pacific Coast-United Kingdom service of **Sir Wm. Reardon Smith & Sons, Ltd.;** also the maiden voyage of the East Lynn.

Since her visit, two other vessels of the line have called, each fresh from its building yard; these were the King City, a steamer, and the West Lynn, a motorship. All three of these vessels are marked by the latest British features of design, and were of great interest to those interested in the trend of cargo vessel designing as exemplified by the modern British owner and operator.

T. A. Lee and Holway are the district agents for the line.

Trade Literatnre

Los Angeles Harbor Annual Report, 1928. This is a very interesting booklet of 95 pages showing the present day status of the facilities and the future expansion plans of this harbor. The book is profusely illustrated with very fine half-tones of the harbor and of the city and hinterland which it serves. The port statistics are arranged in a very readable manner, and the book is one that should be of interest to all who wish to keep abreast of the latest reports of Pacific Coast harbors and the facilities they have to offer shippers.

We have received from the Secretary of Commerce the following annual reports for the fiscal year ended June 30, 1928:

Report of the Commissioner of Navigation. This report gives a brief outline of the extent of American shipping on June 30, 1928· various developments in navigation Laws, and various miscellaneous data pertaining to enforcement of navigation laws, preventing overcrowding of passenger vessels, appointment of shipping commissioners, a report on the Passenger Act of 1882, navigation receipts, and publications.

The report shows that on June 30, 1928, the merchant marine of the United States, including all kinds of documented craft, comprised 25,385 vessels of 16,683,061 gross tons, of which 2336 seagoing vessels of 10,882,793 gross tons were of 1000 tons or over, compared with 2447 vessels of 11,071,918 gross tons on June 30, 1927.

Report of the Commissioner of Lighthouses. This report is a summary of the activities of the Lighthouse service during the year the improvements to lighthouses and lightship service, and statistics covering the various aspects of this important branch of the federal government service to shipping.

American Marine Standards Committee has compiled and has ready for distribution the following bulletins on marine equipment. They may be purchased for 5 cents each from the Government Printing Office, Washington, D.C.

AMSC 4, Rigging Fittings for Ships; AMSC 35, Insulation of Piping and Machinery on Ships; AMSC 36, Magnesia Molded Pipe Covering and Blocks; AMSC 38, Asbestos Millboard; AMSC 39, Hair Felt for Insulation; AMSC 40, Cotton Duck for Insulation Coverings; AMSC 41, Metallic Packing for Condenser Tubes; AMSC 42, Ship Propeller Details; AMSC 43, Rubber Air Hose; AMSC 44, Rubber Steam Hose; AMSC 45, 1½-inch Water Hose, Rubber-Covered; AMSC 46, 2½-inch Water Suction Hose Smooth Bore; AMSC 47, Oil Suction and Discharge Hose Rubber Covered; AMSC 48, Scupper Valves, sizes 3, 4, 5, and 6 inches; AMSC 49, Cargo Boom Fittings.

SHIPPING BOARD TO SELL LINES.

The Shipping Board at Washington, D.C., will open bids January 15 for the purchase by private operators of the United States Lines and the American Merchant Lines. The date was postponed from November 15 to January 15. It is reported from New York that before the postponement, Joseph E. Sheedy and associates submitted a bid for the purchase of the United States Lines, with the proposal to build seven express liners ranging from 20,000 to 45,000 tons, with speeds of 20 to 26 knots, and to cost about $75,000,000; to be delivered over a period of seven years. It is further reported that this plan will be resubmitted under the new date.

An American Freighter in the Orient

(Continued from Page 17)

national port, the patrol fleets of a half-dozen nations had put in for the holidays.

Up and up the deep though swift current of the river our steamer crept. No docking orders had yet been received. At length a sampan was sighted several hundred yards down the river, with three occupants. One man stood in the bow desperately waving a flag of some description, and two other brown-skinned men worked with equal desperation at the crooked oar at the stern.

Ah Fue, cook of our ship, was summoned to the rail as the sampan and its screaming occupants drew alongside.

"They say," Ah Fue interpreted, "Anchor to twenty-four buoy."

We had passed No. 24, so we were obliged to turn around amidst the traffic of the river. Ships passed up and down, blowing their whistles, while our screws churned the yellow water to foam. At last we reached our mooring—No. 24. Two hausers were paid out and toggled to the buoy. The bite was taken to the niggerhead and like anglers playing with our catch we gradually eased up to the buoy.

A launch, flying the house flag of our operating company, drew alongside and an irate voice came through a megaphone. It wished to know what in the name of all that smells bad, or words to that effect, we were doing where we were.

Our correct docking berth was at pier so-and-so, which was neither the wharf of the Toyo Kisen Kaisha or the Nippon Yusen Kaisha, but some other "kaisha" the name of which I have forgotten. This certain dock, of course, was located back up the river.

A sudden din broke over the ship. It was the deep-chested voice of the first officer, who was trying to make the coolies in the sampan understand that he wanted the hausers "let go" from the buoy. He brandished a chain hook as he yelled. But the misunderstanding coolies only tied another lashing around the toggle and looked blankly up at the mate. No one knew, it developed, where these coolies came from or who they were. Apparently they had mistaken our ship for another.

Ah Fue's Chinese tongue eventually got us off that snag and once more the screws churned the yellow river to foam. Again we were turning around. Incidentally, before the hausers were slipped over the bollard at the dock and the winches had drawn the slack from the forward and after spring lines, the sun was settling behind the roof tops of Shanghai.

If one were to charge off any sum for the wear and tear on the captain's and mate's dispositions, to say nothing of the ship's machinery, it would seem conservative to debit the entire amount of $2500 for this one incident. But there were others.

In Shanghai we remained five days, and there the greater part of her remaining cargo of lumber was discharged. The method of handling lumber in Shanghai is "handling." Everything is done by hand—by man-power. The lumber is thrown onto the dock and from there is carried away by innumerable gangs of coolies. As they struggle from the ship's side with back-breaking loads of lumber they wail a weird chant that sounds like the cry from a broken heart or the long-drawn-out call of a raccoon. Ofttimes the rattling of the winches fell silent because there was no one on the dock to take away the sling-load.

Even though there are approximately twice as many men in Oriental stevedore gangs as there are in our own gangs, and the confusion and noise of loading or unloading a ship is many times as great, the speed of the process should be measured on an inverse scale.

Just how far these struggling coolies carried the lumber was not learned. After trudging across the dock they disappeared under a long shed which ran the length of the wharf.

Our parcel of cargo for Hong Kong on the outbound voyage was small. We were to stop there only one night, and it is likely that that accounts for our anchoring in the stream. Yet there were a score of other merchant ships in the harbor which were discharging into lighters. We also stopped at Hong Kong on the homebound voyage and there was no change in the procedure.

At Manila, as in Shanghai, we moored to the dock, but only because we were the first ship in after one of the piers had been vacated. As was the case in Hong Kong, several other ships lay in the harbor unloading lumber or flour and taking on copra and hemp, or possibly sugar.

Likewise at Cebu the freighter tied up to a pier. She had only flour for this port, the last of her deckload having been delivered. Here, as at Manila, flour was discharged into lighters on one side while copra and hemp were taken aboard from the wharf. Twice during the three days we were at Cebu, the lighters were filled and there were no others available. Waits of two hours in each case were necessary, which of course delayed the ship's departure. Copra and hemp were transported to the pier by inadequate Ford trucks and there were waits of varying lengths of time between loads.

Practically the same situation existed at Iloilo. The exact amount of time lost in these two ports is hard to estimate, but it is apparent that many hours could be saved by improvement of cargo-handling facilities.

Our ship was the first vessel of the line to call at Tacloban. The port is hardly known and its harbor development corresponds to its renown. There is barely enough channel depth to float a loaded ship of the 8800-ton type, and that only when the tide is flowing. Cautiously we crept into the harbor and dropped anchor. Lighters came alongside at once, but when the tide turned it was necessary to move ship three times in order not to become stranded in the mud.

A full day was lost at Tacloban when the bay became too rough for a small steamer, loaded with copra, to tie up alongside of us. This steamer brought cargo from the smaller ports of the islands which cannot be reached by seagoing vessels. No doubt the freight revenues from the cargo was worth the loss of time, but the incident again emphasizes the need for better harbors and more docks.

Returning to Japan we dropped our mud-hook in the stream at Kobe. No offenses against time were noted in the three days the ship lay there and at Osaka, fifteen miles across the bay. These ports have been in the business of loading and unloading ships long enough to have systematized their operations of lighters.

Modern Steam Generation at Sea

(Continued from Page 21)

enced in the straight-tube, cross-drum boiler and which, no doubt, results from the pocketing of steam in the tube at high capacities.

Cleaning

The cleaning of this boiler is simpler, quicker, and easier than the cleaning of a straight-tube, cross-drum, marine, water-tube boiler, as removal and replacement of the large number of handhole plates are eliminated, together with the attendant cleaning of gasket surfaces. In the three-drum, bent-tube boiler there are three hinged manhole covers to be swung in, after which the whole boiler is available for turbining of tubes. This ease of handling will permit of more satisfactory cleaning, resulting in a longer life of tubes and higher steam generating efficiency.

Superheaters

The superheaters in the "A" boiler are supported on special alloy steel brackets designed to withstand the temperatures to which they will be subjected and spaced at frequent intervals with a suitable attachment to the upper and lower drums. The arrangement of soot blowers shown will provide ample cleaning capacity. All superheater repairs can be made from the fire room without an operator entering the boiler casing.

Preheated Air

The air for combustion is preheated by drawing it down the back wall and under the floor. This provides about 100 degrees fahrenheit preheated air and cools these two brick surfaces thereby prolonging their life.

Space Required

The bent-tube steam generator will permit of the installation of more heating surface in a given space than any other type of boiler or steam generator. It would be possible with units of this new type to obtain sufficient steam for 100,000 shaft horsepower from eight steam generators which could readily be fitted into the space available aboard the average passenger ship. As an example, the steamship Leviathan is fitted with 46 boilers of 4400 square feet of heating surface each. The design shown in Fig. 3, would occupy approximately one-quarter of the space of the Leviathan installation for the same amount of steam generated. This indicates the large saving in weight, space, and cost of a modern steam generator as compared with previous boiler designs.

A further point in favor of the new steam generating unit is the lower comparative radiation loss. With a steam generator having water walls as shown it is possible so to insulate the setting as to reduce the radiation, improve the economy, and lower boiler room temperatures.

In some of the modern power plants ashore it is necessary to heat the fire rooms in winter to keep them at a temperature necessary for good working conditions.

The draft requirements of such a steam generator can be satisfactorily taken care of by the use of an induced-draft fan only, while any other arrangement for similar economy, using air preheaters in place of the economizers, would require the addition of a forced-draft fan.

Special Applications

Among the interesting applications of the modern principles in design is that given in Fig. 4, which shows a steam generator especially adapted to shallow-draft vessels where over-head space is unusually limited. The first installation of this type of steam generator has recently been completed and the initial trials have been highly successful.

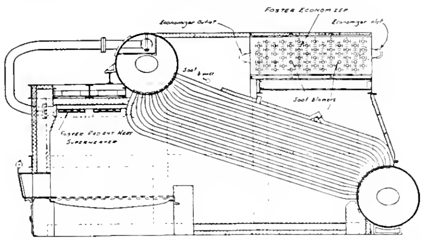


Fig. 4. Two-drum, bent-tube, marine steam generator of the Nelis type, particularly adaptable in vessels where there is low head room but where ample fore and aft space is available. In actual practice, this type has given exceptionally satisfactory results.

Conclusion

There is a large shipbuilding program now under consideration. The new ships are to be built for greater speeds than those of the present fleet. The cost, size, weight, and the commercial efficiency of the boiler room or steam generating equipment will be important factors in the contemplated vessels. Therefore, the new methods of steam generation—those that have been developed since the last shipbuilding era—are receiving the closest study of marine engineers. The principles here mentioned have been tried out in marine work for a number of years—long enough to show their true worth and importance in the building and operation of more profitable steamers.

Modern steam generators in conjunction with improved steam-using equipment will provide a reliable and efficient propelling plant, lower in both installation and operating costs than any other type of prime mover.

Three Book Reviews

(Continued from Page 3)

premacy in the palmy days of sail. The narrative loses nothing in interest or value from the fact that much of the text pertaining to the voyages of the great McKay clippers is practically identical to that of articles which have appeared from time to time in Pacific Marine Review. It is a very readable, well balanced volume, and should be on the shelves of every sea-loving bibliophile.

Some experiences as a boy on an American sailing ship fifty years ago led to the writing of THE MAKING OF A SAILOR, by Frederick Pease Harlow, Publication No. 17 of the Marine Research Society of Salem, Massachusetts. This book is a transcript from a diary kept by the author during a short coastal voyage and a long overseas voyage in American sailing ships in the 1870's. It features many escapades in South Sea ports.

Pacific Marine Review

The National Magazine of Shipping

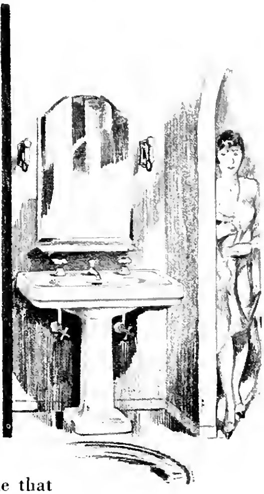
FEBRUARY, 1929

Official Organ

Pacific Marine Review, Vol. 26, No. 2, Published Monthly at 576 Sacramento Street, in San Francisco. Entered as second class matter at the post office at San Francisco under the act of March 3, 1879.


The New
Buda-M.A.N. Marine Diesel
Comes to the Pacific Coast
Take this opportunity to see the latest achievement in Marine Diesel Engines for workboats, yachts, cruisers, and similar vessels.
This engine is a high-speed, light-weight compressorless, airless-injection, full-Diesel engine of the four-stroke-cycle type, with small space requirements, great dependability, unusually simple operation, flexibility of control, and low fuel consumption.
You will be amazed at its compactness. You will view an innovation in Diesel marine engine construction. Be sure to see it.
ON DISPLAY AS FOLLOWS:
SEATTLE, WASH.—Richard Froboese Co., 83 Marion St. On or about January 15.
SAN FRANCISCO, CALIF.—Dahl Electric Co., 111 Mission St. On or about February 10.
WILMINGTON, CALIF.—Ets-Hokin & Galvan, 218 Avalon Blvd. On or about March 1.
THE BUDA COMPANY
HARVEY (Chicago Suburb) ILLINOIS

Distinguished Accommodations that attract prosperous guests



What inviting possibilities, here, for the steamship line that would set itself out and apart from its rivals—even from those who aspire to equal distinction!

Bath and toilet accommodations which lend charm to the suite of which they are a part. Baths of Acid-Resisting Enamel, for instance, that lastingly preserves its lustrous surface unmarred by spot or stain.

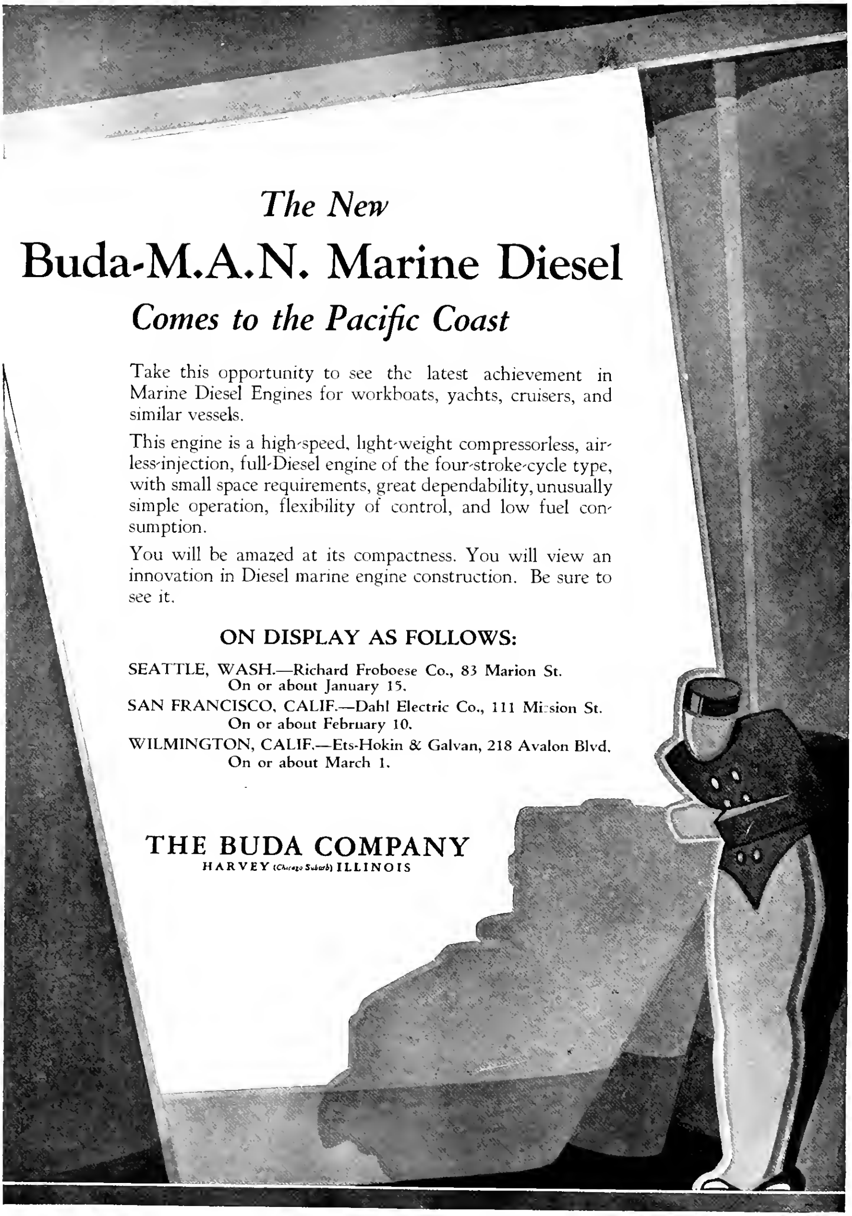
Lavatories of latest design. Veritable dressing tables, they are, even to the benches. And color! A choice of eight beautiful shades from delicate orchid to rich ultra-marine (as well as black, and white). What more distinguishing mark of service than a recognition of this modern vogue. And what a magnet for particular people!

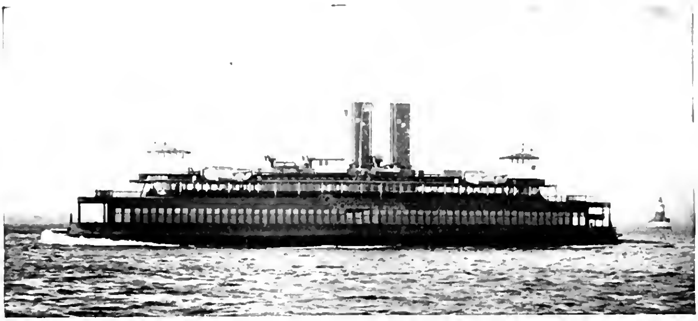
Yes, there are inviting possibilities, here, which "Standard" is in unique position to develop for you. Through more than a quarter century it has advanced the cause of serviceability and appearance in plumbing fixtures.

And the prevailing acceptance for "Standard" Plumbing Fixtures betokens an acquirement of goodwill which no progressive steamship line should lightly regard. Inquiry is invited.

Standard Sanitary Mfg. Co.
Marine Fixture Department
Pittsburgh

"Standard"
PLUMBING FIXTURES


The New
Buda-M.A.N. Marine Diesel
Comes to the Pacific Coast
Take this opportunity to see the latest achievement in Marine Diesel Engines for workboats, yachts, cruisers, and similar vessels.
This engine is a high-speed, light-weight compressorless, airless-injection, full-Diesel engine of the four-stroke-cycle type, with small space requirements, great dependability, unusually simple operation, flexibility of control, and low fuel consumption.
You will be amazed at its compactness. You will view an innovation in Diesel marine engine construction. Be sure to see it.
ON DISPLAY AS FOLLOWS:
SEATTLE, WASH.—Richard Froboese Co., 83 Marion St. On or about January 15.
SAN FRANCISCO, CALIF.—Dahl Electric Co., 111 Mission St. On or about February 10.
WILMINGTON, CALIF.—Ets-Hokin & Galvan, 218 Avalon Blvd. On or about March 1.
THE BUDA COMPANY
HARVEY (Chicago Suburb) ILLINOIS

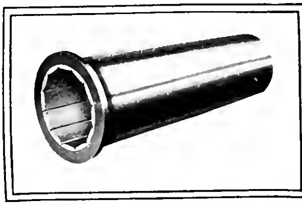


City of New York adopts Goodrich Cutless Bearings for Ferryboat "American Legion"

PHOTO shows municipal ferryboat "American Legion," owned and operated by the Department of Plant and Structures, City of New York.

This ferryboat has a gross tonnage of 2,089 tons, is 264 feet in length, and is equipped with two 14" diam. Goodrich rubber propeller shaft bearings. Goodrich Cutless Bearings are also being installed in the sister ship to the American Legion now under construction at the Staten Island Shipbuilding Co.

The choice by the New York Department of Plant and Structures of Goodrich Cutless Bearings for the ferryboat "American Legion," and her sister-ship, as well as for the "Henry A. Meyer," the "Reigelman," the "Julius Miller" and the "Gowanus," constitutes important new evidence of the rapidly widening recognition of these extraordinary bearings by naval engineers and naval architects. Goodrich Cutless Bearings radically reduce costs of bearing renewal on commercial installations. They have demonstrated that they pay for themselves out of savings in drydocking expense alone.



GOODRICH CUTLESS BEARINGS *produce notable economies in sand dredge, barge, and other shallow-water service, where sand and grit are present. The grooves in the rubber surface of a Goodrich Cutless Bearing serve not only as a means of lubrication but also to pass sand particles or other gritty material.*

Goodrich Cutless Bearings outlast every other type of bearing. They are lubricated entirely by water. Tail shafts show less cutting and scoring than with any other known bearing. Vibration is radically reduced.

Send to the distributor nearest you for additional information, or to The B. F. Goodrich Rubber Co., for catalogue and technical data.

DISTRIBUTORS

METROPOLITAN DISTRICT: Topping Bros., 159 Varick St., New York City.

FREEPORT, L. I., N. Y. The Columbian Bronze Corp.

BOSTON, MASS. Walter H. Moreton Corp., 1043-45 Commonwealth Ave.

HARRISBURG, TEXAS Peden Iron & Steel Co.

LOS ANGELES, CALIF. Pacific Goodrich Rubber Co., 1386 E. 7th St.

NEW ORLEANS, LA. Arthur Duvics Sons, 122 Chartres St. Alker Donovan Co., Inc., 435 Camp St. Stauffer Eshleman & Co., Ltd.

WASHINGTON, D. C. R. L. Fryer, Special Rep., B. F. Goodrich Rubber Co., Cutless Bearing Division, 430 Transportation Bldg.

CHICAGO, ILL. K. M. Walker & Co., 327 So. La Salle St.

JACKSONVILLE, FLA. Gibbs Gas Engine Co., of Florida, 26 South Main St.

PHILADELPHIA, PA. Marine Equipment & Supply Co., 116 Walnut St.

SEATTLE, WASH. Pacific Goodrich Rubber Co., 115 King St.; Pacific Marine Supply Co., 1223 Western Ave.

SAN FRANCISCO, CALIF. Pacific Goodrich Rubber Co., 650 Second St. Ford & Geirrine, Balfour Bldg.

DETROIT, MICH. H. H. Smith & Co., 334 E. Jefferson Ave.

TAMPA, FLA. Knight & Wall Co.

BALTIMORE, MD. The James Walker Co., 123 Light St.

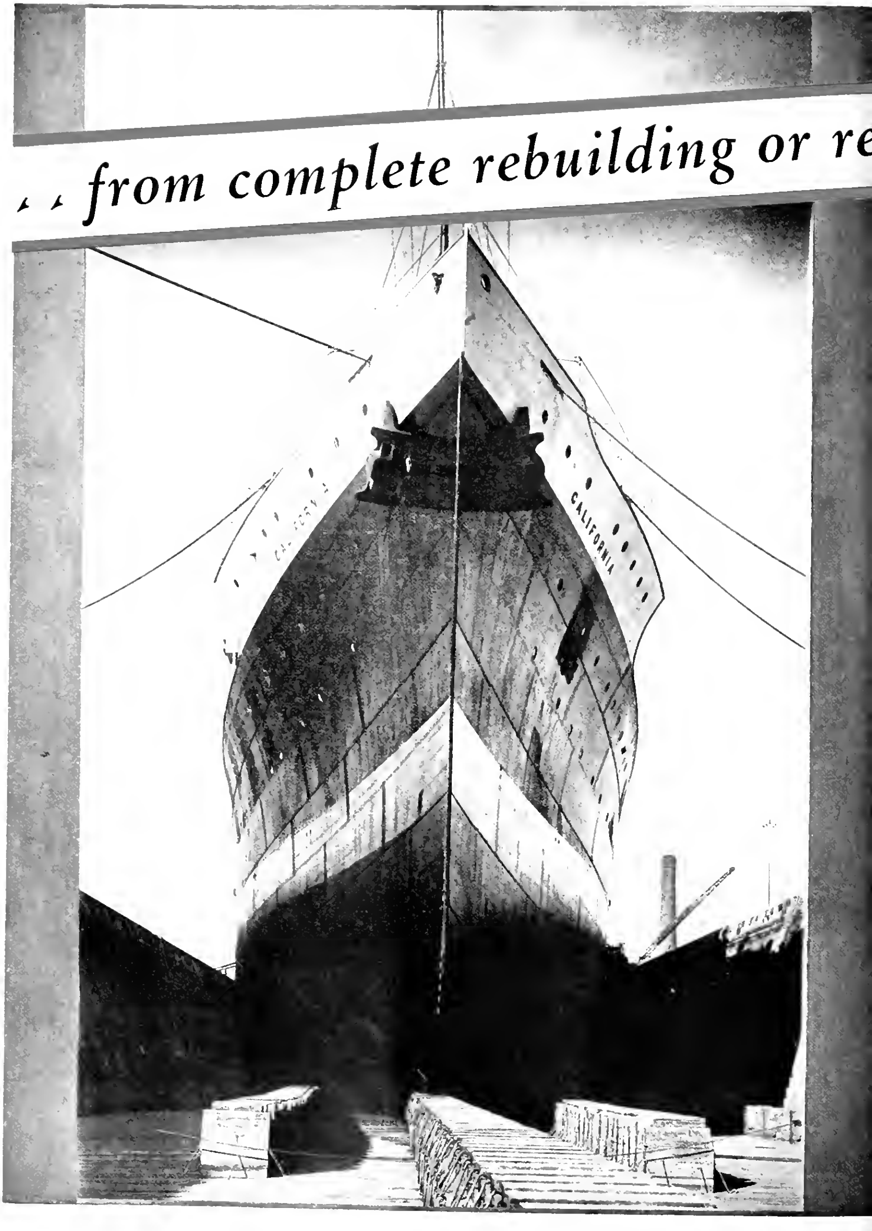
LANCASHIRE, ENGLAND British Goodrich Rubber Co., Ltd. Leyland

FRANCE Societe Francaise B. F. Goodrich, Colombes (Seine).

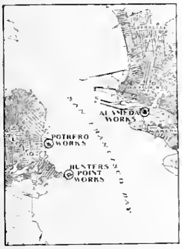
The B. F. Goodrich Rubber Company

Goodrich

. . *from complete rebuilding or re*



conditioning to simple paint job



As this map indicates, Union Plant's three yards on San Francisco Bay are convenient to the shipping interests in and about the City of San Francisco.

SITUATED on San Francisco Bay, convenient to the shipping trade in and about San Francisco Harbor, lie three units of Bethlehem's Union Plant—Potrero Works, the only combination shipyard and drydock plant in the City of San Francisco — Hunter's Point Works, with its two spacious graving docks, one of them the largest commercial dock in the world—and Alameda works, with its two large marine railways.

The fourth unit of Union Plant is San Pedro works, situated on Los Angeles Harbor, and equipped with a 15,000-ton Drydock.

In addition to the repair and drydocking facilities of these four yards, Union Plant has pattern shops, blacksmith shops, machine shops and foundries equipped to handle ship repair jobs of any magnitude, whether they embody the complete rebuilding or reconditioning of a vessel, or a simple scraping or painting job. There is no job too large, none too small for Bethlehem's Union Plant.

BETHLEHEM
(UNION PLANT)
FACILITIES

ON SAN FRANCISCO BAY

Potrero Works

1 Floating Drydock	6500 tons
1 Floating Drydock	2500 tons
1 Floating Drydock	2000 tons

Hunter's Point Works

1 Graving Dock	1020 feet
1 Graving Dock	750 feet

Alameda Works

1 Marine Railway	4000 tons
1 Marine Railway	2000 tons

ON LOS ANGELES HARBOR

San Pedro Works

1 Floating Drydock	15,000 tons

Union Plant's San Pedro Works, situated in East San Pedro, is convenient to the shipping that touches Los Angeles Harbor. Facilities here include a floating drydock capable of handling the largest vessel.

BETHLEHEM
SHIPBUILDING CORPORATION, LTD.,
BETHLEHEM, PA.

GENERAL SALES OFFICES:
San Francisco: Matson Bldg. New York: 25 Broadway
District Offices in Boston, Philadelphia, and Baltimore.

BETHLEHEM
SHIP REPAIRS *on the* PACIFIC COAST

Pacific Marine Review

CONTENTS

February, 1929

Frontispiece

Editorials 49
American Shipbuilders Deserve Square Deal; Rescues at Sea; Steamboat Inspection Service; Pacific American Election.

Home Port of American Shipmasters 51

Pacific Coast Trade Round the World 52
Dollar Steamship Company completes, with great credit, its five-year contract with the United States Shipping Board, realizing the prophecies of its founder.

Safety on Marine Terminals 54
Steamship Association, Shipowners' Association, and Waterfront Employers' Union issue rules for the safe handling of cargo, of gear, and of trailers on the waterfronts of California harbors.

Fuel and Safety. By Arthur M. Tode 56
Oil versus coal in relation to safety of seagoing vessels, with particular reference to the ill-fated steamship Vestris.

Shake-Down Cruise of a Coast Guard Cutter
By S. D. Henderson 58

Trade, Traffic, Shipping:
- Foreign Trade Outlook. By Dr. Julius Klein 60
- Major Trends in Foreign Trade 21 Blue Section
- Union Oil in the Antipodes .... 21 Blue Section
- Freights, Charters, Sales .... 23 Blue Section
- Direct Mail to South America 23 Blue Section

In the Engine Room:
- Mechanics for Marine Engineers, Part V. By A. L. Becker 62
- Getting at the Bottom of a Nut and a Knock 64
- Greatest Speed on Earth. By W. L. Schaphorst 64
- How to Hold a Bolt in a Slot 65
- How to Bend Pipe 65

Workboats and Their Power Plants:
- Diesel Sales Brisk in Southern California.... 66
- A Motor Barge at San Pedro 68
- Buffalo Boat Motors 69
- Seattle Ship Chandler Expands 69

Auxiliaries, Ship Supplies, Marine Equipment:
- Progress in Electric Propulsion 70
- Modern Equipment on a Turbo-Electric Passenger Liner 72
- Latest Development in Buda-M.A.N. Marine Diesel Engine 73
- Hand-Steering Gear on Virginia 74
- Elwell-Parker Tractor Crane 75
- A New Type of Port Terminal 75
- Yale and Towne Service Building 76
- Ralston R. Cunningham 76

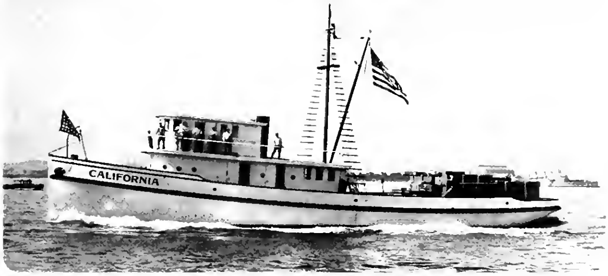
Marine Insurance 77

American Shipbuilding 82

Miscellaneous:
Organization Notes, 65; Index for Volume XXV (1928), 89; Who's Who Afloat and Ashore, 11 Blue Section; Trade Literature, 21, 23 Blue Section.

Index to Vol. XXV (1928) Pacific Marine Review will be found on Page 89 of this Issue

DEDICATED TO
PACIFIC OCEAN SHIPPING



Tuna Fishing

The "California" is owned by Messrs. Ralph and Manuel Silvera of San Diego, California.
Length—115 ft.
Beam—25 ft.
Draft—11 ft.

The "California" is another of the large size Pacific Coast fishing boats equipped with UNION engines.

Her main engine is a 300 H.P. UNION Diesel; a 27 H.P. UNION Diesel engine is used for auxiliary power.

5" Centrifugal pumps pump sea water to bait boxes and bait wells for live bait.

A refrigeration unit is provided, as well as an electric light system.

The "California" was designed by Mr. Manuel Madruga, and built by the Campbell Machine Company of San Diego, dealers in UNION Diesel engines.

Bulletin 63, which will be sent upon request, illustrates many other commercial and pleasure craft.

Union Diesel Engine Co.

Oakland **California** **U. S. A.**

Established 1885

J. C. ROHLFS

Manager, Marine Department Standard Oil Company (California) and newly elected President of the Pacific-American Steamship Association.

Pacific Marine Review

The National Magazine of Shipping

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

Entered as second class matter June 20, 1913, at the post-office, San Francisco, under the Act of March 3, 1879. Entire contents copyright, 1928, by J. S. Hines. Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 15th. Subscription price, a year; domestic, $2; foreign, $3; single copies, 25c.

Official Organ
Pacific American Steamship Association

James S. Hines,
President and Publisher.

Bernard N. De Rochie,
Vice-Pres. and Manager.

Official Organ
Shipowners' Association of the Pacific

Alexander J. Dickie,
Editor

Paul Faulkner,
Advertising Manager.

American Shipbuilders Deserve Square Deal

THE act authorizing construction of cruisers for the United States Navy and known as The Cruiser Bill, H.R. 11526, has been passed by the House of Representatives and is now before the Senate for action. The Dallinger Amendment to this bill, named from its sponsor, Frederick W. Dallinger, and added to the original bill in its passage in the House makes compulsory the construction of eight out of the fifteen cruisers in government navy yards. This amendment was passed against the advice of the Navy Department and is very prejudicial to the best interests of national defense and the vested interests of American shipbuilders.

During the twenty-year period ending January 1, 1928, the naval building program of the United States aggregated 533 vessels, with a total displacement of 1,706,860 tons. Private yards built 470 of these vessels as compared with 63 for the navy yards. The 470 vessels displaced 1,174,568 tons, and the 63 vessels, 532,292 tons. Expressing it another way, out of 533 vessels built during twenty years, the private yards built 88 per cent of the number of ships and 68.9 per cent of the displacement tonnage. The figures covering the same period for Great Britain show an even larger proportion of naval construction done in private yards.

During our participation in the World War, our navy yard establishments had to practically discontinue all new construction, their plant and personnel being taxed to the utmost maintaining the existing fleet in condition for war service. Of the new naval tonnage produced during the war period, 93.8 per cent was constructed in private yards.

These figures indicate an experience, skill, and ability in the private yard organizations that are an invaluable asset to the navy plans for national defense. Already under post-war neglect of both navy and merchant marine construction, several of the finest private shipbuilding plants have been forced out of the business, one at least permanently.

Small wonder that the wise heads of the Navy Department are opposed to the Dallinger Amendment. This opposition is well expressed in the following extract from a letter dated March 12, 1927, addressed to the Secretary of the Navy by the Bureau of Construction and Engineering of the Navy Department:

"An added reason for private construction—and one entirely apart from the economy of the situation—is to be found in the fact that the shipyards (those that have built the major portion of our fleet) are a vital necessity for national defense. It is well known that with the practical cessation of merchant fleet construction, during recent years, some, if not all, of these yards are in a very precarious condition financially. Unless work is given them in the near future, it is doubtful if several of those we have most relied on for many years past for our best war products will survive as shipbuilding yards. In these circumstances the placing of orders for these cruisers in private yards is considered of great importance, particularly if the cost of the work therein is materially less than in navy yards.

"Summing up the above, it is believed that considerations of economy, of early construction and of conserving national assets for turning out war products, point clearly to the fact that the Government's interests can best be served by placing these vessels in private yards, provided reasonable bids are received, as there is every reason to expect."

All the shipbuilders of the United States ask is a fair chance in competitive bidding against the navy yards, and surely they should get that. Any shipbuilder who has kept his establishment running in these United States of ours for the past seven years certainly deserves all the breaks of the game now that there is some work in sight.

Let's kill the Dallinger amendment, give the shipbuilder a fair deal, and get better ships more economically.

"When the government once enters a business it must occupy the field alone. No one can compete with it. The result is a paralyzing monopoly."

—Calvin Coolidge.

Rescues at Sea

WHEN we consider the difficulties and the danger involved when an able vessel stands by a disabled sister in rough weather at sea for the rescue of passengers and crew and if possible the disabled vessel, herself, we are forced to wonder at the small percentage of loss and at the skill, patience, and daring of the real seaman of all the seafaring races. Time and again during recent years American vessels

and others have figured in rescue work in a manner that has thrilled the seafaring world.

The Shipping Board, with pardonable pride, has published in "Merchant Fleet News" particulars of some of the rescues effected by its own vessels. Here is a partial list of these events covering about 3 years time:

S.S. American Shipper saved 125 persons from the British S.S. Vestris;
S.S. West Eldara saved 36 men, the crew of French schooner M. F. Fecamp;
S.S. Caspar saved 13 men, the crew of Norwegian motorship Pinto;
S.S. American Trader saved 32 men, the crew of Norwegian S.S. Elven;
S.S. President Taft saved 38 men, the crew of the British S.S. Mary Harlock;
S.S. Aquarius picked up 14 men from two lifeboats of the French schooner Boree;
S.S. President Roosevelt saved 31 men, the crew of British Steamer Antinoe;
S.S. Bibbco saved 29 men, the crew of Italian steamer Elipoli;
S.S. President McKinley saved 47 men, the crew of Japanese S.S. Kyosei Maru;
S.S. Kenowis saved 16 men, the crew of Portuguese schooner Manuel Caragol;
S.S. President Harding saved 27 men, the crew of Italian S.S. Ignazio Florio;
S.S. Springfield saved 7 men, the crew of British brigantine Thames.

(January 22, 1929.) The U.S. Shipping Board steamship America, Captain George Freid, saved 32 men, the crew of the Italian steamer Florida. Rescue completed in full gale in freezing temperatures without loss of a man.

This catalogue representing a very small part of the life saved at sea by American seamen and lifesaving agencies nevertheless accounts for 415 souls from the vessels of six nations at points covering almost a complete circle of the globe. Some of the rescues here listed were attended by tremendous difficulties and one was effected only after the sacrifice of the lives of two American seamen. Here is the radio report covering that incident:

"We lost two men who volunteered to row a lifeboat from the President Roosevelt through the terrific gale, waves 60 feet high, to the sinking freighter Antinoe. Ernest Heitman, 28, boatswain's mate, New York, and Uno Wirtenan, master at arms, Finland, nearly reached the Antinoe, when a great wave engulfed them. They were seen no more. We lost four other boats, but have saved 12 famished sailors of the Antinoe crew."

Later the rest of the crew were taken off safely.

" 'We lost two men'—terse ship report.
Thank God, in times of sheik and sport
The tribe's still true. A wreath to them,
These gallant dead—we lost two **MEN**!

Though there's much work to do today,
And so much golf and bridge to play,
A million cars to whisk away,
Let's pause a moment, just to say,
We lost two **MEN**."

Logs of the merchant and naval vessels of all nations show many rescues at sea and many losses of vessels whose crews and passengers were saved by their own equipment and their own resourcefulness. Investigating committees (senatorial and other) charged with the task of finding out better ways and means of saving life at sea might get more helpful information by studying the successful rescues rather than the disastrous tragedies, awarding merit and encouragement to success rather than insisting on blame and disgrace for occasional failure. In the former case every one would be eager to help the investigation while too often in the latter case those most vitally concerned and most able to give information may be inclined to conceal essential facts.

Steamboat Inspection Service

FOR nearly fifty years the United States Steamboat Inspection Service has been safeguarding the lives of passengers and crews aboard American vessels. During all this time the supervising inspectors of the service have investigated every slightest accident at sea, whether accompanied by loss of life or not. Even the near-accidents are subject to scrutiny. This long experience has built up a large volume of information and a technique in practice which is of great value to the merchant marine. In view of these facts it seems a great pity that Congressmen should so lightly propose to throw overboard this valuable bureau of the Department of Commerce.

A resolution has been introduced to turn the duties of Steamboat Inspection over to the Navy and to increase the scope of inspection to cover stowage of cargo. Let us hope this resolution dies in committee. The Navy has enough troubles now, and the present Steamboat Inspection Service is one of the best of the minor bureaus of our national government.

Let Congress remember when thinking of marine disasters that no supervising body ashore can control the actions of men in an emergency at sea. For always "Seas are Seas and Men are Men," whether on the Titanic, the Vestris, or the Spanish Armada.

Pacific American Election

ON January 18 was held the annual election of officers of the Pacific American Steamship Association. Captain Robert Dollar, who for many years has been annually re-elected as president of this association, was elected to the office of Honorary President, a title created especially for this Dean of American shipping.

J. C. Rohlfs, manager of the marine department of the Standard Oil Company (Calif.) is now president of the association. Roger Lapham, president of the American-Hawaiian Steamship Company, is first vice-president. Captain C. W. Saunders, Matson Navigation Company, is second vice-president. R. J. Chandler, Los Angeles Steamship Company, is third vice-president.

The new directors are: Captain Robert Dollar, J. C. Rohlfs, Roger Lapham, Captain C. W. Saunders, R. J. Chandler, Wm. Groundwater of the Union Oil Company, M. J. Wright of the Luckenbach Steamship Company, and George D. Zeh, of the Associated Oil Company.

J. H. MacLafferty, representative of the Pacific American Steamship Association at Washington, D.C., was also re-elected to the office of vice-president; and J. P. Williams was re-elected to the office of secretary and treasurer.

Home Port of American Shipmasters

THE illustration reproduced herewith gives an excellent panorama of Searsport, one of Maine's quaint seacoast villages, located on the Atlantic Highway, 110 miles from Portland, 30 miles from Bangor.

For many years this village has been famous as the home of oldtime master mariners, many of them wealthy, but adventurers all, and men of daring. Overlooking beautiful Penobscot bay and islands, its atmosphere has attracted a large colony of summer vacationists from many states, who have built places or remodelled the little white farm houses with which the locality abounds. The town supports no newspaper but boasts of an excellent community library, the gift of Amos D. Carver of New York in memory of his father, Captain George A. Carver, former local shipbuilder and shipowner.

Some six miles distant from Searsport are the grounds of the Northport Country Club, with excellent tennis courts and a sporty nine-hole golf course. The district is called one of the coolest summer resorts on the entire Maine coast.

The following list of captains and ships gives some idea of the influence that the Searsport Shipmasters had on the American merchant marine in the palmy days of sail. It is worthy of note, too, that many of these ships were built at Searsport, which fact was undoubtedly responsible for the large population prior to 1890.

A LIST OF SHIPS COMMANDED BY SEARSPORT MEN, 1834 - 1927

The first ship commanded by a Searsport captain was the Henry Leeds, 379 tons, built at Prospect Marsh in 1834 for Captain Jeremiah Sweetser Sr., of Prospect, now Searsport. Following is a complete list of Searsport shipmasters who were either born in Searsport or resided there while in command. Searsport was incorporated as a town February 13, 1845. The population in 1850 was 2,208; 1860, 2,583; 1870, 2,282; 1880, 2,322; 1890, 1,693; and 1900, 1,365.

Captain	Ship
Dudley O. Black,	St. James
Daniel O. Blake,	Harriet McGilvery
Osias Blake,	Caroline Reed
John C. Beals,	Richard Nesmith
Shepard Blanchard,	Louis Walsh
Elbridge Blanchard,	B. F. Metcalf
Albert N. Blanchard,	Puritan
Phineas B. Blanchard,	Bangalore
Edward D. Blanchard,	Henrietta
William H. Blanchard,	Gov. Robie
John C. Blanchard,	Wachusett
James P. Butman,	E. B. Sutton
Peter C. Cane,	Frank Pendleton
Benj. Carver 1st,	B. Aymar
Benj. Carver 2d,	L. J. Morse
James N. Carver 1st,	Charter Oak
John A. Carver,	John Bunyan
Charles G. Carver,	B. F. Carver
Phineas P. Carver,	Charter Oak
Nathan P. Carver,	Susan Gilmore
Frank L. Carver,	S. P. Hitchcock
Andrew L. Carver,	Mary L. Stone
William M. Carver,	Susan Gilmore
Caleb F. Carver,	St. Nicholas
Jesse T. Carver,	St. Marys
J. Herbert Colcord,	Elizabeth
Benj. F. Colcord,	Centennial
Theodore P. Colcord,	A. J. Fuller
Theodore P. Colcord	John McDonald
Theodore P. Colcord	Henry B. Hyde
Lincoln A. Colcord,	State of Maine
George W. Colson,	Mary Hammond
Albert N. Colson,	R. D. Rice
Edward L. Colson,	Wildwood
John L. Crawford,	Harvey Mills
Winthrop S. Crowell,	Flying Eagle
Lebbeus Curtis,	Edward D. Peters
Eben Curtis,	Tillie E. Starbuck
Henry G. Curtis,	John C. Potter
Clifton Curtis,	Belle of Bath
Samuel Curtis Jr,	Henry S. Sanford
John Dow,	C. B. Carver
Leroy Dow,	John Currier
Amos A. Dow,	Lucy A. Nickels
Norman Dunbar,	Louisiana
George H. Eames,	Mary Goodell
Oscar G. Eaton,	Oneida
Thomas B. Ellis,	France
Josiah L. Emery,	Guiding Star
James T. Erskine,	W. H. Connor
Amasa D. Field,	Lucy A. Nickels
Joseph C. Field,	Andrew Jackson
Alanson Ford,	Kennebec
James Ford,	A. S. Davis
William T. Ford,	Harriet McGilvery
Frank N. Gerry,	S. F. Hersey
Welcome Gilkey,	C. R. Hazeltine

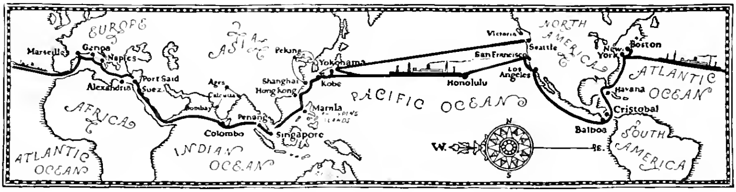
Captain	Ship
Lincoln Gilkey,	Charter Oak
Isaac F. Gilkey,	Dakota
Philip R. Gilkey,	Josephus
James C Gilmore,	Henrietta
J. Locke Gilmore,	Western Chief
Daniel S. Goodell Sr,	Mary Goodell
Daniel S. Goodell Jr,	Brown Bros.
Daniel S. Goodell Jr.	Charger
William H. Goodell,	Gov. Robie
Edwin L. Griffin,	Charlotte White
Phineas P. Griffin,	Leonora
Frederick W. Hanson,	Calcutta
Royal Harriman,	Mary Goodell
George W. Hichborn,	Queenstown
Sewell Lancaster,	W. J. Rotch
Henry T. Lancaster,	Sachem
Augustus Lanpher,	B Aymar
George McClure,	John C. Potter
Charles C. McClure,	Fort George
John W. McGilvery,	Pharos
Freeman McGilvery,	Wellfleet
James McGilvery,	Oneida
Selwyn N. McGilvery,	David Brown
Frank W. McGilvery,	Oneida
Benj. S. Merithew,	Premier
John G. Merryman,	Matilda
James G Merryman,	R. B. Fuller
Edward M'Grath,	Ocean Traveller
Clarence N. Meyers,	Thomas Dana
J. C. Nickels,	Wild Rover
David Nickels,	Belle of Bath
J. Fred Nickels,	Onward
Albert V. Nickels,	Iroquois
E. D P. Nickels,	May Flint
James N. Nickels,	Frank Jones
Sewell L. Nickels,	Sachem
Amos Nichols Sr,	Martin Luther
Charles Nichols,	Melrose
James Nichols,	Champlain
George A. Nichols,	Abner Coburn
Wilfred V. Nichols,	W. H Conner
John P Nichols,	Living Age
Amos Nichols Jr,	Gov. Robie
William G Nichols,	Belle of Bath
Edward P. Nichols,	Frank Pendleton
Jasper N. Nichols,	Charter Oak
Wilson C. Nichols,	Resolute
Charles M. Nichols,	A. J. Fuller
Peleg B. Nichols,	R. R. Thomas
Cyrus G. Nichols Sr,	Matilda
Cyrus G. Nichols Jr,	R. R. Thomas
Joshua B Nichols,	S. P. Hitchcock
Alexander H. Nichols,	St. Mark
Daniel C. Nichols,	Wandering Jew
Allen Noyes,	Mary Goodell
Benj. Park,	Henry R. Wright
Charles C. Park,	Alert

Captain	Ship
Abner Coburn	Melvin L. Park,
Joseph H. Park,	Josephus
Jeremiah H. Park,	Luzon
Isaac C. Park,	Leonora
Oliver C. Park,	Henry B. Wright
Phineas Pendleton 2d,	Vistula
Phineas Pendleton 3d,	Henry B. Hyde
B. F. Pendleton	Nancy Pendleton
John G. Pendleton,	Grace Ross
John G. Pendleton Jr,	Solferino
James G. Pendleton,	Bell Rock
Nathan Pendleton,	Dunbarton
Ephraim Pendleton,	Statesman
George W. Pendleton,	Henry S. Sanford
Timothy C. Pendleton,	Louis Walsh
Frank I. Pendleton,	W. H. Connor
James N. Pendleton,	Mary L. Cushing
Charles Pendleton,	Golden Rocket
Andrew S. Pendleton,	Aryao
J. Frank Peterson,	Bennington
Robert Porter,	Matilda
William A. Rogers,	Helicon
Andrew J. Ross,	Premier
Simon Ross,	Chandos
Andrew M. Ross,	Henrietta
Charles K. Sawyer,	B. Aymar
George C. Small,	State of Maine
Chandler Smart,	Thirty-one States
Jeremiah Sweetser 1st,	Henry Leeds
Jeremiah Sweetser 2d,	Mary Goodell
Joseph P. Sweetser,	Zephyr
Forest W. Treat,	St. Paul
Willard Treat,	Henry B. Wright
Joseph W. Wallnutt,	W. R. Grace
Charles Waterhouse,	Moonlight
Asa H. Waterhouse,	S. F. Hersey
Frank Watson,	Jacob C. Ridgeway
Albert T Whittier,	Paul Revere
Oren C. Young,	Reaper

CAPTAINS	STEAMERS
Theodore P. Colcord	Columbian
Charles M. Nichols	Mexican
Amos A. Dow	Californian
Lincoln A. Colcord	Virginian
James W. Ford	Montanan
Frank E. Curtis	Oregonian
Joseph F. Nichols	Texan
James B. Parse	Washingtonian
Josesh D. Sweetser	Hawaiian
Scott Blanchard	American
Jeremiah Merithew	Vestal
Isaac Carver	Caesar
Harry L. Perry	Georgian
George M. Curtis	West Kazvott
E. D. P. Nickel	Alexander
Clifton Curtis	Caisania
Hollis H. Blanchard	Portland

November 26, 1898

A panoramic view of Searsport, Maine.



Pacific Coast Trade Round the World

Dollar Steamship Company Completes, with Great Credit, its Five-year Contract with the United States Shipping Board, Realizing the Prophecies of its Founder

THE other day at Pier 44, San Francisco, about 150 exporters, importers, and transportation men met for luncheon on board the steamship President Polk at the invitation of the Foreign Trade Club to do honor to Captain Robert Dollar. The occasion was unique in that it marked the completion of the five-year contract under which the Dollar Steamship Company purchased from the United States Shipping Board seven of the freight and passenger vessels known as the "502" type and guaranteed to maintain these vessels in a westbound round-the-world service with a minimum schedule of 10 trips a year for the five years.

Shipping Heads Skeptical.

The moving spirit of this gigantic undertaking was approaching his eightieth birthday when this contract was signed. He had obligated himself and his firm to do something which had never before been done and to do that thing on a tremendous scale. The wise shipping men of the world's greatest ports shook their heads sadly. "Had Bob Dollar, too, gone soft in the head?"

Dollar, however, has always been a very remarkably long-headed and clear visioned executive. He was not taking a leap in the dark, but was seeing clearly many of the obstacles and risks involved in this venture. He had operated some of his freighters in a round-the-world service along substantially the route proposed. He had established agencies and friendships and a name for integrity in the ports and with the nations involved. He knew that keen competition would come from the ships of many nationalities.

Dollar Reports Progress.

And now in the dining saloon of the steamship President Polk, Robert Dollar is giving his friends of San Francisco an account of the results of this, perhaps the most amazing commercial adventure of all time. That at the age of 85 he should do this personally, with a clear voice, and in a very forceful manner is characteristic of this "Dean of American Shipping."

Dollar went round the world with his first ship, acting as his own sales-manager. He told all his agents what "they were up against," "the shoals and rocks ahead," the "possibilities in trade." At Singapore he expected to get a share of the rubber carrying trade; at Penang he believed they would get some tin. Not a pound of either was forthcoming on the first several trips.

"Boys," said he, "my coat is off to get the business for this line and to make the service the best obtainable, and I expect your coats to be off too."

Half Million Loss in Six Months.

After striking a trial balance on the first six months operation, the Dollar Steamship Company found itself $465,000 in the "red." Captain Dollar went round the world again. This time he said, "Boys, a year ago I told you my coat was off and your coats must be the same; and now I tell you I have taken off my shirt and I expect your shirts to come off likewise."

The Captain then told many of the shrewd methods that had been used to show shippers in foreign ports the advantages of shipping on the Dollar Line, not because of lower rates, but because of dependable, adequate, better service at even or higher rates than those charged by competitors. "Any fool can start a rate war; the wise steamship operator demonstrates better service for a better rate." This has been a slogan with the line, and of the results, "I can merely state that business is now satisfactory." When an executive of the Captain Dollar type says that "business is satisfactory" you can depend on it that business is "pretty good."

Pacific Coast Trade Extension.

It is always interesting to watch the reactions of business men to the remarks of Captain Dollar, and this Foreign Trade Club luncheon was no exception to the rule. He held his audience under a spell for a full half-hour. When the meeting adjourned many expressed the thought that he was more full of "pep" and vigor than the majority of men half his age. He, himself, says that he and his line are just beginning. His example certainly should be a very potent inspiration to the young men of the Pacific Coast.

An established service of this kind is in reality an extension of Pacific Coast Trade Round the World. In this connection the facts and figures of the development of business by this service are very interesting.

In carrying out its contract with the United States Shipping Board, the Dollar Steamship Line has performed better than 200 per cent. The contract called

for a guarantee of 50 round the world trips in the five years, whereas the log of performance shows 107 trips completed. Departures from all ports on all trips have been substantially on schedule. A mileage of 2,900,000 has been logged by these steamers in the 107 trips. Over $1,500,000 have been spent by the line on the Pacific Coast for food alone; 5,250,000 meals have been served; $4,000,000 have been spent for fuel oil; millions have been paid out in wages and salaries afloat and ashore; and millions more in voyage repairs, betterments, and reconstruction. The great majority of these expenditures are directly adding to Pacific Coast prosperity.

New World Markets Opened

During the five years just past the Dollar Round-the-World Service has been directly responsible for opening up new markets to Pacific Coast merchants amounting to a sales total of over $30,000,000. And as the Captain says, "This is just a beginning."

Much of this business is entirely new development, started by experimental shipments. Introduction of California sardines to the Straits Settlements and the East Indies is one striking example of this pioneering method. Some four and a half years back, an introductory shipment of three cases of California packed sardines was sent out for distribution, a can or two here and there to retail merchants in Singapore and other cities. The result was amazing even to the packers of this excellent food product. The Dollar Line alone has carried 875,000 cases of California sardines during the past four years—and this is just a beginning.

The shipment of other Pacific Coast products is growing in like proportion and the sales messages of Pacific Coast producers and manufacturers are being carried round the globe in a most practical and gainful way.

Rapid Expansion of Trade.

The volume of business offering to the Dollar Line is increasing steadily and the line is now putting on more tonnage and will soon be building some new vessels. At the same time other lines are getting into the trade on a round-the-world basis, and the lines formerly operating along parts of the route from Europe to Asiatic ports and return have bettered their tonnage and their schedules. There has been no rate war, and no unfair competition. In fact the spirit of friendly rivalry has dominated these services and the competition has resulted in a higher grade of transportation for both freight and passengers.

The Pacific Coast honors Robert Dollar, and the whole shipping world pays respect to him. He has succeeded in the shipping business in a measure given to very few of the world shipping magnates and has also achieved as a man and citizen to an extent granted to few of his fellows. He is the head of a large family of successful and highly respected sons and daughters, grandchildren, and great grandchildren. The partner of his early struggles is still by his side, sharing in the joy of fulfillment.

Surely the word "Realization" could now be written largely over the career of Robert Dollar. But apparently his eye is not dimmed, neither is his natural force abated, for he is still looking forward to much greater records for Pacific Ocean Trade and to much greater expansion for the Dollar Steamship Services.

Our Foreign Customers

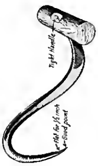
THREE of the countries constituting the British Empire appear among the first ten best customers of the United States as disclosed in an analysis of our foreign trade appearing in "Our World Trade," issued by the Foreign Commerce Department of the Chamber of Commerce of the United States last month.

Canada tops the list with $679,952,000, 19.1 per cent of the exports from the United States for the nine months ending September 30. The United Kingdom is second with $548,997,000 and Australia eighth with $103,475,000.

The three countries took from the United States an aggregate of $1,332,424,000 in goods out of an export total of $3,482,556,000.

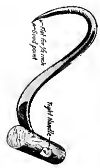
Other countries among the first ten best customers were Germany, with $298,986,000; Japan, with $183,969,000; France, with $154,259,000; Argentina, with $121,709,000; Italy, with $103,475,000; and the Netherlands, with $100,671,000.

George E. Williams, president of the Foreign Trade Club of California, and Frederick L. Koster, director of the Club, congratulating Captain Robert Dollar on the occasion of a luncheon given by the Foreign Trade Club on board the Dollar Line steamer President Polk to celebrate the completion of the contract of the Dollar Steamship Company with the United States Shipping Board for the operation of a freight and passenger service round-the-world.



Safety on Marine Terminals

Steamship Association, Shipowners' Association, and Waterfront Employers' Union Issue Rules for the Safe Handling of Cargo, of Gear, and of Trailers on the Waterfronts of California Harbors



General Safety Instructions.

1. Every injury received at work shall be reported immediately by the injured person to his foreman or immediate superior. The injured employe shall see to it that every wound, however insignificant it may appear, is at once treated by the employer's authorized first-aid attendant, or doctor, and carefully guarded against the penetration of dust and other impurities. As long as the injury is not protected by the prescribed emergency covering, the injured person shall not be permitted to work.

2. "Horseplay" and scuffling on the job are prohibited.

3. Employes shall, as far as possible, remain near their work.

4. Entering dark holds, decks, or compartments without a light is prohibited.

5. Employes in the vicinity of moving machinery should wear closely fitting clothing.

6. Safety shoes are available from the Company at wholesale prices, and will prevent many injuries to the feet.

7. Employes shall not unnecessarily walk on or ride strongbacks or beams.

8. Employes shall use only the safe gangways provided when going to and from, or about, the ship.

9. Walking over covered hatches shall only be done in case of necessity. Take time to go around.

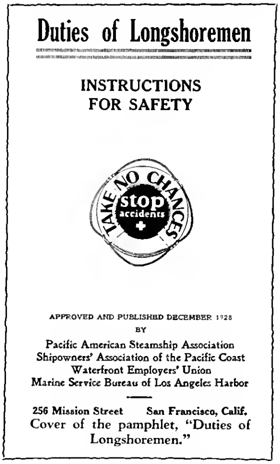
10. All precautions for safety shall be taken when it is necessary to use a ladder. Do not use any ladder that is not properly secured.

11. Docks, decks, and other working places shall be kept clean and orderly.

12. Employes are expected to do everything possible to prevent fires on the ships and docks. No smoking on ship or dock.

13. No longshoreman under the influence of intoxicating liquors will be permitted to work.

14. When lifting a heavy object, be sure of your footing. Bend your knees; keep your back straight, and push up with your leg muscles, and avoid painful back strains, and ruptures.



Duties of Longshoremen

INSTRUCTIONS FOR SAFETY

APPROVED AND PUBLISHED DECEMBER 1928
BY
Pacific American Steamship Association
Shipowners' Association of the Pacific Coast
Waterfront Employers' Union
Marine Service Bureau of Los Angeles Harbor

256 Mission Street San Francisco, Calif.

Cover of the pamphlet, "Duties of Longshoremen."

Cover of the pamphlet, "Duties of Longshoremen."

15. Stand clear of unguarded crankshafts and other moving machinery.

Safe Handling of Cargo.

18. Stacking or taking down a pile of any sort of cargo shall be done with necessary caution.

19. Riding cargo hooks is prohibited; however, in emergencies, and under safe working conditions, specially prepared slings may be ridden in and out of the holds, under the orders and direct supervision of the foreman in charge of the hatch.

20. Standing or working under hanging loads is prohibited.

21. All cargo raised by hoisting gear shall always be carefully secured against falling or spreading.

22. Poorly prepared or unsafe loads shall not be hoisted.

23. When cargo is being hoisted or lowered by hoisting gear, employes should stand from under.

24. In hoisting lump coal, or similar cargo, in baskets, tubs, etc., care is to be taken that the containers are not filled above the rim.

25. When handling cargo by means of chains, hooks, or claws, the greatest care is to be employed; the chain's parts are to be pulled tight, and the hooks and claws securely fastened, so that the cargo cannot fall.

26. In slinging up a load, or hooking on empty slings, employes shall be sure that their hands and feet are not in a position to be caught by slings or bridles. Stand clear of bights.

27. When assisting to steady or land a load on the dock, the employes shall never stand between the load and the ship, or between the load and any fixed object, and shall always face the load.

28. Before using any cargo hand hook, it shall be properly sharpened, free from rust, and have a tight handle.

29. While working cargo which is liable to shift or roll on employes, the cargo shall be secured or blocked.

Safe Handling of Gear.

32. If tools, materials, appliances, or any gear furnished by the Company are at any time found to be out of repair, defective, or in any way unsafe, employes shall report the same to the person in charge of the work **immediately**, and thereby avoid taking any unnecessary risks arising therefrom.

33. Removal of existing protective appliances is strictly prohibited.

34. Blocks, crow-bars, chain-slings, or other heavy equipment, shall not be thrown from deck to ship's holds, or from deck to dock.

35. A load shall not be lifted with a chain that has a kink in it.

36. Winches, conveyors, belts, and all driving gear may be lubricated while in motion only when this can be done by means of suitable contrivances, without danger.

37. Lubricating and oiling while a machine is in motion may only be done by persons authorized to do so.

38. Cleaning of machine parts may only be done while the machine is standing still.

Safe Handling of Winches.

41. No employe may operate a machine unless he is qualified in

its operation. Do not work with any machine unless authorized by the person in charge.

42. Winch drivers shall, before hoisting cargo, assure themselves that the fall is in good order and securely clamped to the winch drum, and that the winch is in good order; and shall, under all circumstances, correct all faults found. If they cannot do this, they shall give notice to their immediate superior at once.

43. Winch drivers shall not leave steam-propelled winches unattended unless the main steam valve is closed.

44. A winch driver shall take signals for operating a winch from but one man—the authorized signal man. Men signaling hatch tenders or winch drivers shall do so in a positive manner.

45. Winch drivers shall not sit on hatch coamings, or in such a manner that they may fall into the hatch. Such seats as are necessary shall be strongly made, and well secured.

46. Extensions on operating levers of winches shall be of firm wood, or preferably of adequately sized metal, and safely secured to the regular handles.

Safe Use of Motor Vehicles and Trailers.

49. The speed of jitneys or tractors shall, under no conditions, exceed ten miles an hour on docks or wharves. Where there is congestion, the speed shall not exceed five miles an hour.

50. Jitney drivers shall test brakes, steering gear, etc., before using the machine.

51. When, in the line of duty, an employe finds it necessary to ride a jitney, tractor, or trailer, he shall sit or stand so that he has a secure hand-hold; so that no part of his body extends beyond the sides of the vehicle, and so that he will not be injured by shifting or moving loads.

52. Jumping off or on moving vehicles is prohibited.

Special Safety Rules.

55. Apply the rule of reason and common sense, as well as the above rules; they are intended for your protection and guidance.

56. Remember that "Every rule for safety is written in the blood of a workman."

First Aid Rules.

59. Prompt and intelligent first-aid may save a man's life. Learn how to do it right.

FOREWORD

Every longsboreman, while employed as such, is insured by bis employer, either under the State or Federal Compensation Acts, assuring bim medical attention and hospital care in case of injury, and also, under certain conditions, a certain percentage of his average wages if he is partially or totally disabled by such accident. The amount of compensation received by the injured employe will not compensate for the suffering endured as a result of an injury, and is only a portion of the wages he could have earned if not injured. It is to his advantage, as well as the Company's, to observe strictly these instructions for the prevention of accidents.

Every dock or wharf on which work is done by this Company is equipped with a first-aid kit, which is in charge of an authorized attendant. The location of such kit, the name of the person in charge thereof, the telephone number of the Emergency Hospital, and the name, address and telephone number of the Company's physician are posted on the Company's bulletin board.

Foreword of pamphlet, "Duties of Longshoremen."

60. Before moving an injured man, look him over carefully to see how badly he is hurt.

61. Look for bleeding, fractures, or dislocations, and see if breathing has stopped.

62. Bleeding from a cut artery comes in spurts, and should be immediately controlled. It can be stopped by pressing your fingers on the artery between the cut and the heart.

63. Do not move a man who has a broken leg, thigh, or back, or other serious fracture, or dislocation, but immediately send for the Company's authorized First Aid Attendant.

64. Don't depend upon a pulmotor or any other mechanical device for reviving a drowning man. Attempt to revive him immediately by first getting the water out of his throat, and cleaning out his mouth. Then lay him face down. You can make him breathe by alternately applying and releasing the weight of your body through your own hands placed over his short ribs. Work in time with your own deep breathing. Don't stop, and don't permit any one to move the man until he is breathing normally. Keep the man warm, and send for the doctor. Every longshoreman should know how to revive a drowning man.

65. If a man is seriously injured, don't let him sit up. Keep him quiet and warm, and handle him carefully.

66. Don't touch any wound with your fingers, or cover it with unclean handkerchiefs or other material.

67. Don't wash wounds.

68. Don't put tobacco juice on a wound.

69. Don't neglect splinters, scratches, and small cuts, as there is always danger of blood poisoning when the skin is broken.

70. Have all injuries treated by the authorized First Aid Attendant.

PREPARED
by the
SAN FRANCISCO HARBOR ADVISORY COMMITTEE
of the
U. S. EMPLOYEES' COMPENSATION COMMISSION

WARREN H. PILLSBURY, Deputy Commissioner, U. S. Employees' Compensation Commission, Chairman.

FRANK C. GREGORY, Safety Engineer, U. S. Employees' Compensation Commission.

CAPTAIN F. M. EDWARDS, Chairman, the Associations' Safety Committee.

CAPTAIN J. G. LUDLOW, A. E. STOW, H. KELLY, Waterfront Employers' Union.

E. R. PARKER, H. McPHEE, Shipowners' Association of the Pacific Coast.

J. B. BRYAN, E. STEIN, San Francisco Longshoremen's Association.

CAPTAIN W. J. PETERSEN, San Francisco, Marine Service Bureau.

BYRON O. PICKARD, Safety Engineer for Associations' Accident Prevention Department.

San Francisco Harbor Advisory Committee is responsible for the compilation of the pamphlet, "Duties of Longshoremen."

(Editorial Note) The above rules, issued in pamphlet form, have been adopted and put in use by the majority of the stevedoring firms at San Francisco and Los Angeles harbors.

As printed, the rules have blank spaces after extra numbers between each heading, and suggestions are asked for additioned rules to fill these spaces and for constructive criticism on the printed rules.

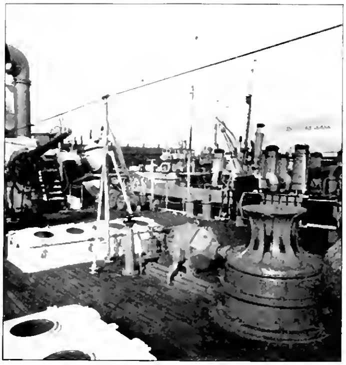
The committee that prepared these rules is to be congratulated on the simple, direct phraseology and on the form adopted for the pamphlet. There is nothing here that may not be understood readily by the foreman on the job or any of the men working under him.

We are informed on credible authority that the aggressive program for safety carried out on the San Francisco waterfront is bringing excellent results. It is said that the record for 1928 shows an average lost time accident ratio at San Francisco that compares favorably with that of any port in the United States.

Shake-Down Cruise of a Coast Guard Cutter

By S. D. Henderson, Engineer, Boston Service Department,
Westinghouse Electric & Manufacturing Company.

A FEW weeks ago the new Coast Guard cutter Chelan with a full complement of officers and crew and several guests left the Boston Navy Yard on her maiden trip, a so-called ten day "shake-down" cruise. A standard speed of ten knots was maintained and various lightships were picked up as we made our way down the coast. Three days after our departure, storm warnings were received and we barely had time to make Delaware Breakwater to escape an 84 mile an hour gale. Continuing on our trip the following day we passed Cape Hatteras and finally headed toward Bermuda. Seas were heavy but the new cutter proved herself a good sea boat.



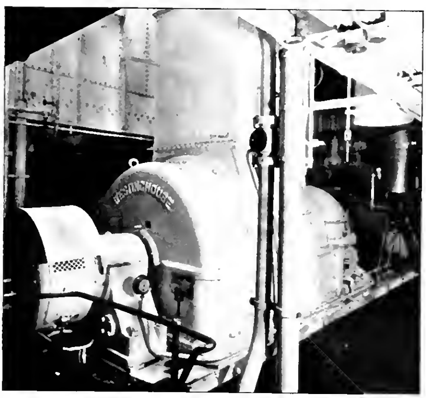
View on the after deck of the new turbo-electric Coast Guard cutter Chelan, featuring 3-inch anti-aircraft gun and electrically driven capstan.

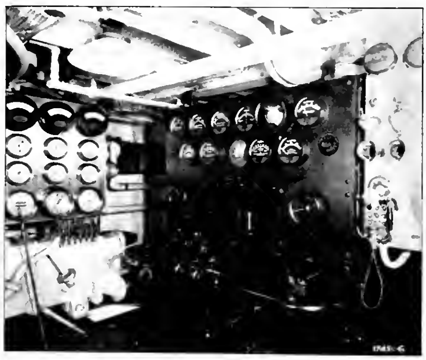
Arriving at Bermuda after eight days out, we moored to a buoy in the picturesque harbor of Hamilton and all hands went ashore for the evening. One has no fear of being run down by a "hit and run" driver in Bermuda as no motor vehicles are allowed on the island, bicycles and horses being used for transportation. Sight-seeing from a buggy is excellent as one cannot miss a thing. Everyone enjoyed the evening ashore and on returning to the ship we learned that an S.O.S. had been received and we were to go to the assistance of the training ship Newport, which was disabled near the Azores.

An extra supply of water and provisions was taken aboard the following day and soon we were driving full speed ahead for the Newport one thousand miles away. We steamed forced draft for three days and nights until right after the noonday meal of the fourth day, when the Newport with sails set loomed on the horizon. Provisions were transferred, a twelve-inch hawser sent aboard, and shortly we had the training ship in tow and were headed for New York about two thousand miles away.

With calm seas a towing speed of nine knots was logged for the first two days, but then the weather grew bad and speed was reduced to four knots to keep the Newport from being towed under. For eight days more we plowed along with speed ranging from four to nine knots, and finally brought the training ship safely into New York harbor. Much credit is due Captain Dempwolf and his crew for their excellent display of seamanship in successfully completing this long tow under extremely adverse weather conditions.

The New York State Nautical Ship Newport is a 1050 ton barkentine equipped with an auxiliary engine. She was on her yearly cruise with about 120 students and crew, when about 500 miles off the Azores she lost her propeller. Absolutely becalmed the Newport, in spite of having all sails set, had logged only a few miles in two weeks. Provisions had run low and the arrival of the Chelan was most welcome.



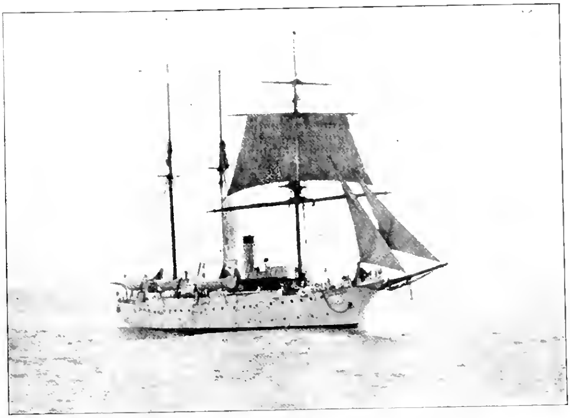


Above: Control station, engine room of cutter Chelan.
At left: Westinghouse turbo-generator. Total shaft horsepower 3200.

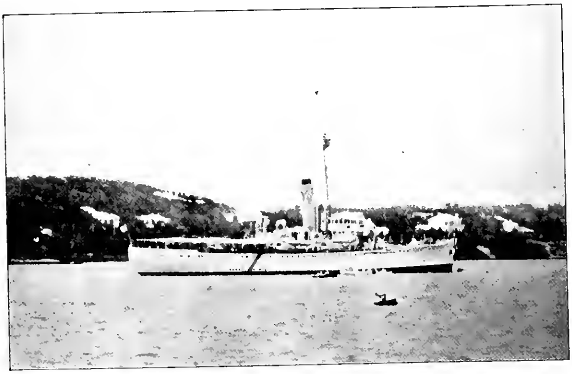
The machinery of the Chelan received a severe test during this unusual maiden trip, and its excellent performance throughout the entire voyage paid high tribute to its design and manufacture.

The Chelan was the first of five cruiser-type cutters constructed by the Bethlehem Shipbuilding Company for the United States Coast Guard Service. She, and her sister ships, Pontchartrain, Tahoe, Champlain and Mendota, are 250 feet long, with a 42 foot beam, and displace 2100 tons. These vessels are all equipped with turbine electric drive manufactured by the Westinghouse Electric & Manufacturing Company.

It is of interest to the Pacific Coast that these five cutters are all equipped with Washington-Estep diesel auxiliary generating sets, built by the Washington Iron Works



Training ship Newport of New York State, becalmed off the Azores.



Coast Guard cutter Chelan moored in Hamilton Harbor, Bermuda.

of Seattle. These sets consist of a 4 cyl. 110 H.P. 600 R.P.M. Washington-Estep Diesel engine, direct-connected to a 50 K.W. direct current generator and a 30 K.W. alternating current generator. These sets were shipped east and installed in the ships on the ways.

The Chelan is to be permanently stationed on Puget Sound, and the Tahoe is to operate out of San Francisco. Both of these vessels are now on their stations and are exciting much favorable comment for their propulsion and general equipment. They are the fastest coast guard cutters of their class in the service, being capable of better than 16½ knots an hour at sea.

Other items of interest in the power plant of the new Coast Guard cutters are Babcock & Wilcox boilers of the interdeck, superheater type furnishing steam at 250 pounds gauge pressure and 250 degrees superheat. These boilers are fitted with Babcock & Wilcox fuel oil burners of the combined forced draft-natural draft type.

Quimby screw pumps are used for the fuel oil service in duplicate. One electrically driven and one driven by steam turbine.

Diamond soot blowers are used, and Babcock & Wilcox feed water regulators.

Warren centrifugal pumps are used for main circulating service, for fire service, and, in a battery of three, for a general, all-around service, including everything from sanitary system to deck washing.

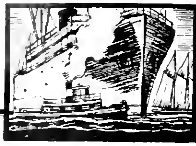
Schutte and Koerting eductors are used for freeing the bilges from water.

Kingsbury bearings take the thrust of the screw, and the shaft tube bearing is a 14-5/8-inch diameter Goodrich Cutless Rubber bearing. Water for lubricating this bearing is provided by a 2-inch pipe from the main circulator discharge through the condenser. This pipe has no valves except a check at the stern tube.

GENERAL MACHINERY CORPORATION

THE business of The Niles Tool Works Company, formerly owned by the Niles-Bement-Pond Company and The Hooven, Owens Rentschler Company, both of Hamilton, Ohio, are now consolidated under the ownership of the General Machinery Corporation.

This consolidation is significant and is bound to be of real benefit to the trade as a whole, because it brings under one management the entire engineering and manufacturing resources of two companies that have been in existence for sixty and eighty-three years, respectively, manufacturing heavy machinery of all kinds. The plants, modern in every way, located in Hamilton, Ohio, a section noted for its skilled mechanics, are equipped with excellent machinery and unsurpassed foundry facilities.



Trade, Traffic, and Shipping

Foreign Trade Outlook

By Dr. Julius Klein, Director,
Bureau of Foreign and Domestic Commerce, Department of Commerce.

THE year 1928 closed with domestic business larger than ever before and foreign trade in exceptional volume, and there is every indication that the high levels of recent months will be carried into the New Year. The output of farm crops during 1928 was about 5 per cent larger than in the preceding year, and industrial production showed an even greater increase. Exports of merchandise were larger than in any year since 1920, exceeding five billion dollars.

The automotive and construction industries continued throughout 1928 to be the back-log of America's prosperity. Automobile production was larger than in any earlier year and contracts for future construction showed a substantial growth. The activity of these industries has resulted in a greatly increased demand for many related products such as steel, cement, rubber tires, and refined petroleum.

The world-wide improvement in business conditions in recent years is indicated by the steady expansion in the exports of other nations which has rather closely paralleled the growth of our own trade. The combined figures of ten leading European countries for the first nine months of 1928 show an increase of 5 per cent in value of exports as compared with the corresponding period of 1927. The fact that this expansion is relatively greater than that of the exports of the United States is evidence of the further economic recovery of Europe. Of the ten countries, only Sweden and Finland had smaller exports than in 1927. Germany's trade showed an especially marked growth.

The exports of countries outside of Europe reached about the same aggregate value as in 1927. Canadian exports in the first nine months of 1928 were 6 per cent larger in value than a year earlier, while the total value of exports of four important Asiatic countries declined by 3 per cent., chiefly as a result of the decrease in price of rubber and silk.

The total value of our exports of merchandise increased about 3 per cent in 1928 and was larger than in any of the seven preceding years. As the average prices of commodities exported was unchanged, the change in value of trade measures quite accurately the change in its physical volume. Exports of wholly and partly finished manufactures comprised about three-fifths of the total trade (twice as large a proportion as in 1896-1900). The size of exports of this type of merchandise is determined very largely by the extent and effectiveness of our sales efforts. The further substantial growth of our exports of these fabricated products in 1928 indicates once again our ability to compete successfully with other industrial nations.

Exports of finished manufactures have been steadily expanding for six years, and in 1928 were about 70% higher in value than in 1922. The most marked growth during the past year occurred in the exports of automotive products, which reached a total value of almost $500,000,000 (according to 10 months figures), and were about one-fourth larger than in 1927, the best previous year. During the past six years the value of our automotive exports has increased by about $300,000,000, or more than 150 per cent. As the purchasing power and standard of living of other nations show further improvement, it is probable that there will be yet greater demands from abroad for American automobiles. Marked gains have also occurred in recent years in our exports of many other fabricated commodities—industrial machinery, agricultural implements, office appliances, rubber tires, and cutlery.

Exports of semi-manufactures continued to show a steady growth in 1928, owing to larger sales of copper, iron and steel products, and leather in foreign countries. Exports of copper were about 7 per cent larger in quantity during the first ten months of 1928 than in the corresponding period a year earlier. This increased demand from abroad was accompanied by a steady advance in the price with the result that the value of exports was 15 per cent greater than in the preceding year.

The value of crude materials exported was also larger than in 1927, in spite of a smaller movement of coal, largely because the exports of cotton, tobacco, and undressed furs increased.

Exports of crude foodstuffs were materially reduced, as the movement of wheat and rye was much smaller than a year earlier. Trade in manufactured foodstuffs, on the other hand, showed comparatively little change in value, since a marked growth in exports of canned fruits offset declines in the values of flour and meat sent abroad.

Consideration of the geographic distribution of the trade indicates that exports to all continents except Oceania increased in 1928. Exports to Canada increased 8 per cent and that country advanced to first place in our trade. Much of this gain resulted from larger shipments of automobiles, agricultural machinery, and other manufactured articles.

Exports to Asia showed an even greater growth, amounting to about 12 per cent, as a consequence of largely increased shipments to China, Japan, and the Philippine Islands. Exports to China were about

one-half again as large as in 1927, owing to a marked expansion of sales of illuminating oil, leaf tobacco, cigarettes, and many other manufactured products as a result of improved conditions in that country.

Shipments to South America have also continued their upward trend and reached a total value of more than twice as large as in 1922. Practically all of the growth occurred in our trade with Argentina, Brazil, and Colombia, which were already our largest customers on that continent. The increased purchases of South America as in other recent years consisted largely of manufactured articles—automobiles, machinery, iron and steel products, and gasoline.

The total value of American exports to Europe was about the same in 1927 as in the previous year, the principal changes being increases in shipments to Italy, Russia, Sweden, Spain and Poland, which were about equal to the aggregate decreases in value of trade with the United Kingdom, Germany, and Denmark. The increase in exports to Italy and Russia, and the decrease in exports to Germany were both ascribable largely to changes in the value of shipments of raw cotton, while the most important cause of the decline in exports to the United Kingdom was a reduction in wheat shipments. The larger part of the increase in Swedish trade and also of the decrease in Danish trade resulted from changes in the quantity of automotive products shipped to those countries and apparently represented in large part a decrease in Swedish purchases of American cars assembled in Denmark.

Demand for American manufactures continues to increase in Africa and has caused a steady expansion of our trade with that continent. Exports to Oceania, which also consist largely of fabricated goods, have, on the other hand, been declining as a result of smaller sales to Australia, which has suffered a reduction of buying power owing to the relatively low price of some of its staple products.

Imports of the United States were valued at about $4,100,000,000 in 1928, or 2 per cent less than in the preceding year. There was a further moderate decrease in import prices during the year, so that the quantity of goods imported was actually slightly larger than in 1927. The average price of rubber was about one-fourth lower than a year earlier, and there were also marked declines in the average unit value of raw silk, sugar, and many other commodities which we import in large quantities.

Of the five great economic classes of imports only crude foodstuffs and finished manufactures showed increases in 1928. The rise in value of crude foodstuffs was primarily a result of an increase in both the quantity and average price of our imports of coffee, while about one-half of the advance in imports of finished manufactures was due to increased purchases of burlaps.

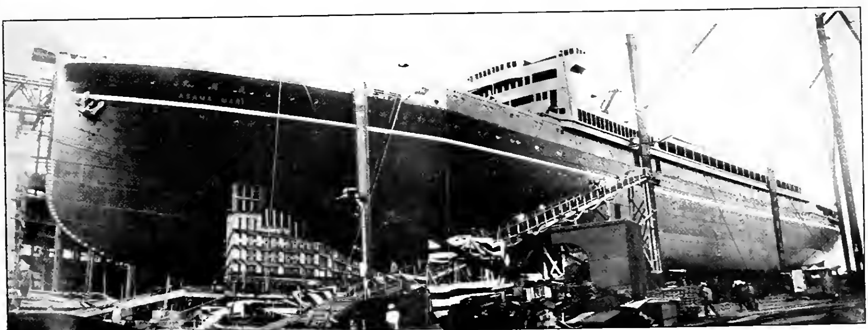
Crude materials, the most important class of imports, decreased in value about 9 per cent, as a result of lower prices of rubber and silk and smaller purchases of rubber, tobacco, and furs. Imports of hides and skins, on the other hand, increased in value by more than one-third, as there were larger purchases at much higher average prices.

Decreases in both the quantity and value of sugar imports accounted for the decline of more than one-tenth in imports of manufactured foodstuffs. There was very little change in the value of semimanufactures imported, as large increases in imports of fertilizers and leather about balanced declines in the value of tin, lumber, and aluminum purchased in foreign countries.

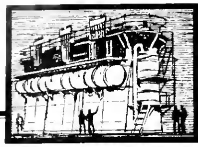
The only important changes in the geographic distrihution of the import trade in 1928 were a decrease in imports from Asia, ascribable chiefly to the lower average prices of rubber, silk, and tin, and an increase in imports from South American which resulted from larger purchases of coffee, nitrates, and petroleum.

In summarizing conditions at the end of 1928, we may state that domestic production and trade are in record volume and that our foreign commerce continues to show steady growth as a result of an increasing foreign demand for American manufactures.

(Section Continued on Page 29, Blue Section)



The Nippon Yusen Kaisha's new motor liner Asama Maru ready for launching at the Mitsubishi Shipyard, Nagasaki, Japan, October 31, 1928. She is 548 feet long, 72 feet beam, 21,800 displacement tons, 16,000 horsepower in four single-acting, 2-cycle, Sulzer diesels; 19 knots sea speed.



In the Engine Room

Mechanics for Marine Engineers

Part V. Winch Capacity and Stress Diagram

By A. L. Becker.

WE now come to an interesting problem which often presents itself to the marine engineer in relation to the capacity of his deck machinery for handling heavy loads in out-of-the-way places where floating machinery or machinery on the deck is not available.

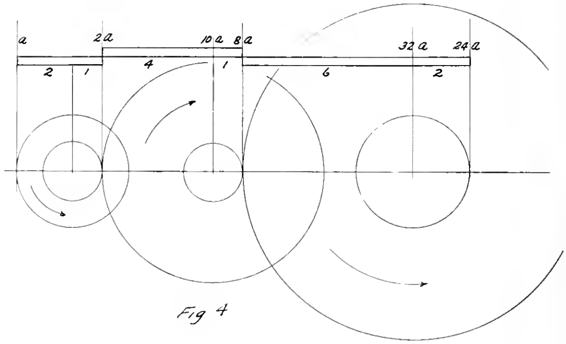


Fig 4

Figure 4 represents a system of three levers with fulcrums at 3a, 10a, and 32a, the ratios of length into which the fulcrum divides these levers are as 2 to 1, 4 to 1, and 6 to 2. By taking moments about each fulcrum the effect of the force A applied to the first lever is evident throughout the system. Its analogy to a triple geared winch or windlass is evident if we assume the larger of the left hand circles, the path of the crank pin, and the smaller circle the pinion on the crank shaft. This pinion engages with the gear of four radius and so on until we reach the smaller of the right hand circles, which may represent the drum or gypsy of the winch or the wildcat of the windlass.

These machines are usually operated by a twin engine at 125 pounds steam pressure with cranks at right angles. The mean turning moment of this type of engine for one revolution is approximately equal to the area of one cylinder times the steam pressure, multiplied by the radius of the crank. The letter A in the system of levers or gears may represent the area of one cylinder multiplied by the steam pressure, and the pull on the drum, gypsy, or wildcat will be 24 times this amount. Likewise the reactions on the bearing will be 3, 10, and 32 times this amount, and the tooth pressure on the gears will be 2a and 8a. As the train of gears is about 80 per cent efficient due to friction of tooth contact and to bearing friction, 80 per cent more or less, depending upon conditions of the final result, should be taken for the pulling force of the machine. Later the statical turning moment of a double engine will be considered.

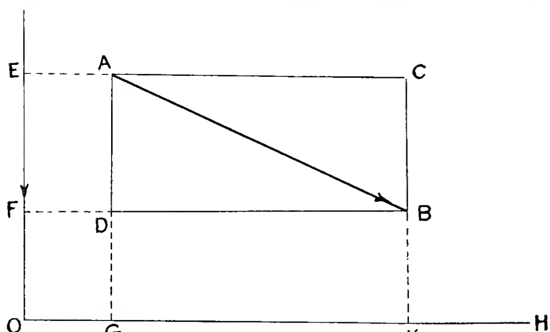


FIG 5

Heretofore, we have considered problems in equilibrium, in which several forces have been acting on different parts of a body such that there was a distance between the point of application of the forces. Also the forces have been considered as acting parallel to either the vertical axis or to the horizontal axis. They have not been acting obliquely to these axes, therefore, their components in the direction of the vertical and the horizontal axes have not been considered.

Figure 5 shows the two axes O.V. and O.H. and the force A.B. acting in the direction indicated and drawn to a scale such that its measured length by the same scale gives the numerical value of the force. Under these conditions the distance E.F. on the vertical axis and the distance G.K. on the horizontal axis represent to the same scale the value of the vertical component and the horizontal component respectively of the force A.B. Conversely the force A.B. is the resultant of the components E.F. and G.K. as it is a construction for a parallelogram of forces A.C.B.D.

In solving problems in statics, the condition of several forces meeting at a common point is often encountered, such as in the consideration of the stresses in a bridge truss, the cargo handling gear, the ship's derrick and shear legs on ships for handling machinery, swinging staging, etc. These problems can all be solved by adhering strictly to the three conditions of equilibrium stated previously. However, wherever components of forces are involved as occurs when the force does not act parallel to the vertical or the horizontal axis the solution may involve functions of angles, a subject beyond the plain rules of arithmetic and therefore not within the scope of the requirements of the rules of the supervising inspectors.

It is proposed to solve such problems graphically; that is, by drawing the forces in their true position by making a line drawing or sketch of the problem as in Figures 6, and drawing a stress diagram which shows the corresponding value of the forces. The tools required consist of a drawing board or clear desk or deck, a scale, a parallel rule, or a straight edge and triangle to draw parallel lines and the ability to measure a line in terms of tons per inch, pounds per quarter inch, or any other suitable scale to suit the conditions.

Referring to Figure 6, A.B., A.C., and A.D. are three forces meeting at the point A. The length of these forces is drawn to represent their intensity. In keeping with the subject "Resolution of Forces," the combined effect of A.B. and A.C. is represented by the resultant A.R. If this resultant is combined with A.D. the final resultant of the three forces will be A.R.$_2$. If the resultant be placed on the opposite side of A, we will then have four forces concentrated at the point A, and these forces will be balanced and the point A will be in equilibium. See (2).

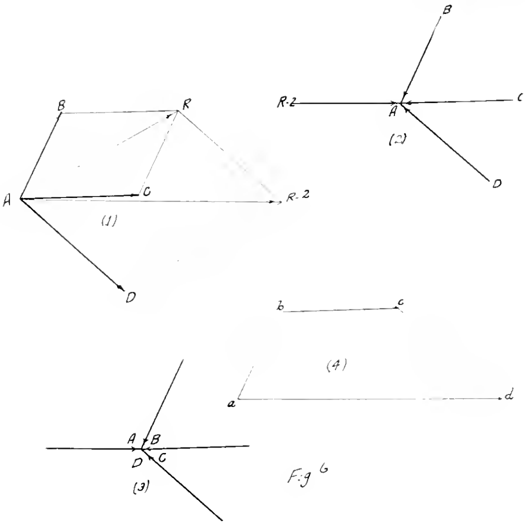


Fig 6

In engineering structures and mechanical devices each of the lines representing the direction of forces in (2) probably extend to the other points corresponding to A, and about which other forces act in the line of members connected to this second point and so on throughout the structure. A bridge truss is a good illustration of this condition, as the points of meeting of diagonals and chords are points of equilibrium. The forces are transmitted through diagonals and chords and the value and direction of the forces are determined on the basis that the point must be in equilibrium or the bridge would not stand.

To simplify the process of resolution of forces by the method in (1) the method illustrated in (3) and (4) is generally employed. Inspection of the two methods will show that the final results are identical.

The same forces shown in (1) are drawn in (3) and in addition, the resultant found by (1) is shown in (2) parallel to its position in (1). The forces in (3) are designated by capital letters and these letters are arbitrarily placed between each pair of forces such that the forces in (3) may be designated by naming the letters on either side of the force. For example the force A.D. in (1) is denoted by D.C. in (3), A.C. in (1) is C.B. in (3), A.B. in (1) is B.A. in (3), and A.R.$_2$ in (1) is A.D. in (3). Note that the capital letters in (3) to designate the forces are for uniformity of practice, always read in the order of left hand rotation. That is, do not read the force A.B. in (1) as A.B. in (3). A.B. in (1) should be denoted in 3 by B.A.

To draw the stress diagram (4), begin at a point d and draw a line parallel to the force D.C. in the direction the force acts, and make its length to c equal to force D.C. to any convenient scale. From c draw the lines c.b. parallel to the force C.B. and equal in length to the force, and from b draw the line b.a. equal and parallel to the force B.A. in (3). If we did not from (1) know the value and direction of the resultant A.D. these particulars could now be determined from (4) by connecting the points a and d, and measuring the distance by the same scale to find the value of the force. Its direction will be parallel to the line A.D. If, however, its value and direction are known (as in this case) from the point a, draw a line parallel to and equal to the force A.D. and if this line as drawn terminates on d, the starting point of the stress diagram, the forces

are in equilibrium. If the diagram does not close, a line drawn between the terminal points will show the error in workmanship to the same scale.

The reader will observe the process is entirely mechanical, and that its use falls within the previous training of an engineer or deck officer in the employment of a scale and a parallel rule or adjustable bevel and straight edge. The graphic method illustrated in the foregoing problem is a mechanical method for the solution of the first two conditions of equilibrium, and is used instead of dealing with angles and their functions in determining the value of components of forces. The method used in (3) and (4) is more practical to use than in (1), although they are identical in principle.

Getting at the Bottom of a Nut and a Knock

A 3000-horsepower job on a Pacific Coast freighter had developed a heavy thump in the low pressure cylinder. The chief and assistant engineers had tried all the well-known ways of locating it. Crank pins brasses had been carefully adjusted, cross heads had been overhauled, guide slippers examined, but the knock was still there. The cards showed a very well set valve, with lead and cut-off O.K. Someone suggested it might be a loose piston, and inspection showed the big nut at top of rod was screwed down hammer tight; and so the theory of loose piston was cast into the discard, though the knock still remained.

The chief was one day telling Mr. Blank, a well-known consulting engineer of San Francisco, about the apparent impossibility of finding out the cause of the thump. At the time, the shop of which the now consulting engineer was then head, was doing some repair work on the vessel. Sailing time was set for next day, and the main engines were being turned over to see all was O.K. The knock on the low pressure cylinder was still there, and the chief called our friend's attention to it, remarking that there was something which would stick him.

Mr. Blank stood near the engine for a few minutes, then said, "Well, the trouble is a loose piston." This was laughed to scorn by the chief, who mentioned that only the trip before they had hammered up on the nut, which was found tight.

"But I am sure it's the reason," said Mr. Blank, and he explained his theory thusly.

"You have told me all the things done to locate the knock, which you have also told me is very pronounced at top and bottom centers when at full speed at sea. However, if you notice, the knock is very pronounced at top center when going slow, as she now is, and but slight at the bottom. The reason is obvious. On the bottom center the slight pressure tends to lift the piston materially, and the shock is absorbed; but when she goes over the top then, to the impetus of steam, is added the weight of piston, and the thump is there. To show you that I feel sure of my diagnosis, I will put my men onto the job, charging nothing for it unless my idea is correct and I cure the trouble. If I am correct, then you sign for the time taken, which will be a cheap job as I have my gang here ready."

To this the chief agreed, and work was at once commenced. It didn't take a great while to get the cover hoisted up and a big wrench on the nut. Sure enough it seemed tight, but when slacked up, it was found that the threaded part of the low pressure rod was slightly bottoming in the nut threads. A steel washer 1/8 of an inch thick was made to fit over the rod and the whole business reassembled. The time taken was about two hours, and when the engine was again started the knock had gone, and so far as known has not returned, and probably will not unless at some future overhaul the washer is left out.

Greatest Speed on Earth

By W. F. Schaphorst.

THE vice-president of a prominent automobile manufacturing ing concern, in writing about the remarkable record of one of his cars, said that the "great record of 13,000 miles in 26,326 consecutive minutes has never been equaled." He said, "Nothing else (except comets, meteors, and other heavenly bodies) ever traveled so far so fast."

I doubted this statement because I know that some electric motors and most steam turbines travel at what is commonly called a "terrific speed." Not knowing the exact speeds, I wrote to a number of manufacturers of steam turbines and received information which I believe is of unusual interest.

One large manufacturer wrote: "The maximum tip speed we use in ordinary practice is 800 feet per second." Multiply 800 by 60 and you get 48,000 feet per minute. Divide that by 5280 and you will get 9.1 as the number of miles per minute made by a turbine blade in ordinary practice.

The 30,000 miles made by the automobile in 26,326 minutes is only 1.14 miles per minute as compared with this 9.1 miles per minute.

In other words, the tip of the turbine blade travels eight times as fast as the automobile travels, continuously, yet the vice-president said, "Nothing else but comets, meteors, and other heavenly bodies ever traveled so far so fast."

A concern that is prominent the world over, a maker of large steam turbines, wrote as follows: "We have in commercial service steam turbine buckets operating at a normal lineal speed of 865 ft. per second at the pitch diameter, and 1140 ft. per second at the tip." 1140 ft. per second is considerably greater than 800 ft. per second. It is equal to very nearly 13 miles per minute.

Another manufacturer said: "Turbines are built with wheels having a lineal velocity of 1200 feet per second. These are commercial machines and, therefore, may be called upon to run "continuously." This is equal to about 13.6 miles per minute.

In writing about a competing machine another manufacturer said that their "small high speed machines ordinarily operate around 1200 ft. a second, and have been known to reach a velocity of 1400 ft. a second with buckets which have been tapered."

This last manufacturer furnishes the information that: "European practice is approximately 1000 ft. a second at operating speed."

As the reader will note, the highest speed reported was 1400 ft. per second, which is equal to 15.9 miles per minute.

It is an interesting fact that even this highest speed is not sufficient to "keep up with the sun" in travel-

ing around the earth. 15.9 ft. per second is equal to 954 miles per hour, or in round numbers 23,000 miles in 24 hours.

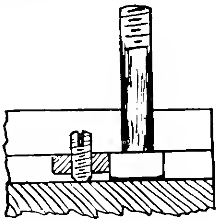
To travel around the earth in 24 hours at its equator, a distance of 25,000 miles, demands a speed of 17.4 miles per minute. To accomplish this will require a turbine blade speed or a speed of anything else of 1530 ft. per second. According to the information I have received, a continuous speed of 1530 ft. per second has not yet been attained.

Bullet velocities of a mile a second have been attained, but bullets, of course, do not move continuously. To make a bullet leave the earth, never to return, a computed velocity of seven miles per second would be required—neglecting atmospheric resistance. The possibility of attaining such a speed is remote.

Gases travel at speeds much higher than turbine blades, and higher even than bullets. But I presume the vice-president of the above company had reference to solid bodies and not to anything fluid or gaseous. Besides, he made it clear that he meant "continuous performance."

How to Hold a Bolt in a Slot

THE sketch herewith shows how easy it is to hold a bolt in a slot. An ordinary nut and screw arranged as shown will keep the bolt from sliding downward if the slot is vertical. If the slot is horizontal and it is desired to lock the bolt so that it will not slide in either direction, place one of the locking devices on both sides. By turning the screw in the nut, with a screwdriver, the nut is pressed up against the lower surface of the slot and is held there rigidly.



How to Bend a Pipe

TO bend large pipes, fill with dry sand and plug the ends. Heat to a red heat in the localities to be bent, and then bend. Be sure that the sand is dry. Where bends are slight, it is often unnecessary to use sand or resin. The object of filling with sand or resin is simply to keep the sides of the pipe from collapsing, or to prevent reduction of flow area. If wet sand is used and if the ends are plugged, the pipe may burst when heated due to the steam pressure generated. Instead of sand, resin is good. There is, however, a right way and possibly several wrong ways to use resin. An example of a wrong way was recently brought to my attention where the mechanic filled the pipe with resin, plugged the ends, and heated the pipe at the place where he wanted to bend it. He watched for a "red heat" just as he would had he filled the pipe with sand. The result was a violent explosion.

To use resin correctly pour it into the pipe and allow it to cool and harden. As soon as the resin is hard, bend the pipe cold. Don't heat it. Then after the pipe is bent, heat the pipe all over sufficiently to melt and remove the resin.

Equal results may be secured by using lead instead of resin. I have been told that on cold days in the Far North they sometimes fill the pipe with water and let it freeze, and then bend the pipe. It sounds plausible, but care must be exercised there on account of the expansion of water when it freezes.

Many excellent mechanical devices are on the market for bending pipe. To bend large, stiff pipe slightly and inexpensively, there is nothing handier or more efficient, in my judgment, than a hydraulic pipe bender driven hy a hand pump.

Organization Notes

Although the plant and general offices of **De La Vergne Machine Co.** have moved from New York to Philadelphia, the firm still maintains a large staff at their New York branch offices, 100 Broadway, New York City.

The tube mills of the **British American Tube Division** of the **National Electric Products Corporation**, which have been under construction on tidewater at Bayway, New Jersey (just outside of Elizabeth) are now completed and production of Blackskin Condenser Tubes and Bulldog Brass Pipe has begun.

These mills replace those of the British American Metals Company, Inc., at Plainfield, New Jersey, which were destroyed by fire the early part of this year, preventing temporarily the manufacture of Blackskin Condenser Tubes and Bulldog Brass Pipe.

The new mills have been designed to handle a capacity about two to three times greater than the mills that were destroyed. The equipment in every respect includes the latest and most modern machinery, all of which is electrically operated and supervised by the highest type of skilled machanics, who have become specialists in manufacturing Condenser Tubes and Brass Pipe.

The Pacific Atlantic Lumber Corporation of Tacoma has just been organized, according to Morgan J. Doyle, of San Francisco, attorney for the new firm, and involves the consolidation of lumber and shipping interests of the Pacific Coast aggregating business investment of $100,000,000. The new company will engage in the business of buying, transporting, marketing, and financing ventures involving lumber and lumber products and is reported to have some very important contracts already concluded on the East Coast.

Offices will be opened in Tacoma, San Francisco, New York, Boston, and Philadelphia. Prominent among the directorate of the new corporation are: William K. Talbot, S. M. Hauptman, James Tyson, F. M. Fenwick, Arthur Cahill, and L. C. Stewart of San Francisco, and Leonard Howarth and Major Everett G. Griggs of Tacoma.

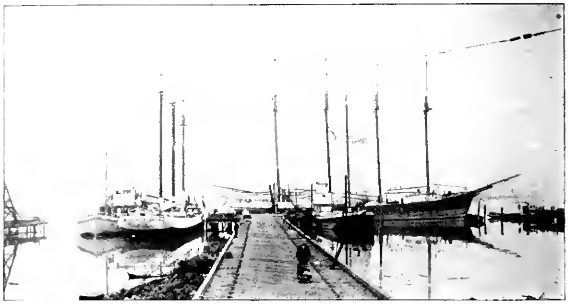
Workboats and Their Power Plants

Diesel Sales Brisk in Southern California

Sales of **Atlas - Imperial diesels** have been brisk in southern California ports. Fred A. Huber, district manager at Los Angeles, reports the past season as good, with several prospects ahead. Among the many installations might be mentioned one made on the fishing vessel Adventurer. This craft, operated in the tuna industry by Captains A. Fellando and Raul Bodanvich, independents, has had her auxiliary gas engine replaced by a 3-cylinder 30-45 diesel, which delivers steady power with dependable accuracy. The owners say it is away ahead of the old gas engine.

Captain Nick Dragich has ordered a 6-cylinder Atlas-Imperial diesel of 200 horsepower for his new offshore fishing vessel, now under construction at a San Pedro yard. The craft will be 86 feet length, fitted with pilot house controls. All auxiliaries are by Atlas-Imperial Engine Company.

The pleasure fishing vessel Harold O. of Santa Monica has had her old gas engine of 40 horsepower replaced by an Atlas-Imperial diesel, 4-cylinder, 40-60 horsepower. The vessel, now in active service, is said by her owners, Captain Olaf C. Olsen and Son, to be faster and much less expensive under the new arrangement, as well as just as easy to start with flexibility in handling.

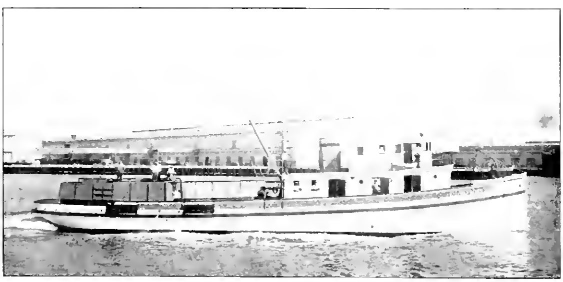


A busy day at the Atlas-Imperial outfitting dock, Oakland, California.

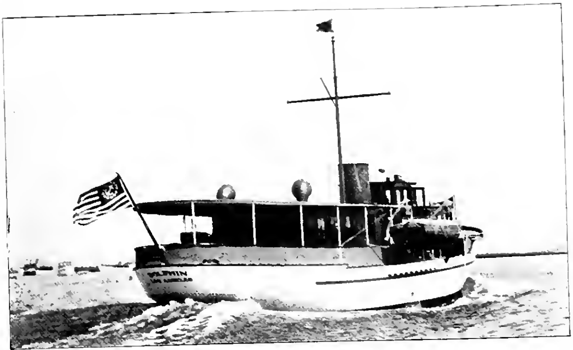
The **Washington Iron Works** and **Washington-Estep** diesel engine agency at Los Angeles, formerly handled by W. H. Worden & Co., has been taken over by Messrs. Ward and Livesey, and will in future be known as the **Ward-Livesey** Co. Mr. Ward has been the Worden company's manager at the Los Angeles branch for many years and has associated with him Mr. Livesey, an executive of ability. The new firm will maintain the Washington-Estep service establishment at Terminal Island, San Pedro, and will in the future as in the past keep up the high reputation of this well-known power motor. Business is reported as good, with quite a few prospective jobs in sight.

James M. Johnson, marine department manager for **Fairbanks-Morse & Co.** at Los Angeles, has been some weeks off duty owing to illness, but is happily again back to normal. He reports that the new taxi workboat Alert has been fitted with one of the new light, high speed, Fairbanks - Morse diesels. This unit at 800 revolution per minute develops fully 90-horsepower, giving the taxi boat high speed and flexible handling facility.

It is on record that in the fishing fleet out of San Pedro 288 of these craft are powered with Fairbanks-Morse diesel engines. From the first down to the latest, the converted steam tug Hermosa, they have all run with little or no trouble. Repeat orders seem to show operators have confidence in them.



August Fellando and Raul Bodanvich operate this fine deep-sea tuna fisher, the Adventurer, and they have recently replaced her auxiliary gas engine with a 3-cylinder Atlas-Imperial diesel.



This beamy cruiser, built by the Harbor Boat Building Co., San Pedro, for Frank W. Davie of Hollywood, runs handily at 12½ knots. She is powered with a 200-horsepower Winton light-weight, high speed diesel.

The Western-Enterprise Engine Co. of Los Angeles is kept busy at marine work, which in addition to its oil field machinery business keeps three shifts of mechanics going steadily.

Among recent marine installations are the engines for the speedy offshore fishing vessel Greyhound, whose 450-horsepower unit has made her a hard one to beat in way of speeds. Captains Luka Alapetch and Andro S. Rapkin are more than pleased with the 4-cylinder 160-horsepower diesel in their new boat.

A 4-cylinder 250 - horsepower Western-Enterprise diesel has been installed in the U.S. Indian Service cruiser for coast service.

Foss Launch and Towboat Co. of Tacoma has replaced an obsolete engine in its workboat Theodore F. with a 6-cylinder, 375-horsepower diesel of the Western Machinery Co.'s build; while the Vail Company has re-engined their Vaquero with a 300-horsepower, 6-cylinder diesel of the same make.

The fishing workboat Glenn Mayne, which has for her main power two 240-h.p. Tosi diesels, has lately been fitted with a 45-horsepower auxiliary by Western Machinery Company.

The St. Therese, a fishing vessel operated by Captain Frank Silva of San Pedro, has had installed a 6-cylinder, 375-horsepower Western-Enterprise diesel engine. This engine is fully reversible. Embodied in it are several new improvements calculated to effect fuel economies.

The 120-foot fishing vessel operated by Matsuuki & Sugiyama, Terminal Island, will have a 450-horsepower Western-Enterprise diesel for main power; also a 3-cylinder, 45-horsepower for her auxiliaries, all of which are electrically operated.

Another Japanese firm, Sakamato & Seki, have ordered a 375-horsepower Western-Enterprise diesel, fully reversible, with a 45-horsepower auxiliary by the same builders.

A new Western-Enterprise diesel of 450 horsepower on the floor of the shop was noticed by a Pacific Marine Review representative on a recent visit to Los Angeles. This engine is the latest product of the firm, and shows many improvements which it is believed will be of advantage to operators. One of these is a duplicate water circulating pump system, thus ensuring against failure in this very important function. Water-cooled valves are also featured, and the reversing has been simplified to a degree, as one revolution of the hand control puts engines in neutral, and another turn into full speed, either way. Solid bronze pumps for sea water circulation and bilges ensure long life for that system. In all ways these units are a great advance in diesel engineering for small vessels.

The Western Boatbuilding Company of Tacoma, Washington, has received contracts to construct seven fishing vessels before May 1, according to M. A. Petrich, president of the company.

The Northwestern Fisheries Company has ordered two 83-foot cannery tenders. The Emil Packing Company of Seattle has ordered a 74-foot cannery tender. Chris Hall of Seattle has ordered a 62-foot combination seine and halibut vessel. The Nootka Packing Company has contracted for two 68-foot seine boats. Peter Marinkovinhk of Tacoma has ordered a 68-foot seine boat.

All the other Tacoma boatbuilding yards report they have contracts which will keep them busy until the fishing season opens.

Two 40-foot express cabin cruisers, designed by **L. E. Geary**, Seattle naval architect, are now building at the plant of the **Grandy Boat Company**, Seattle, for delivery early in February. One is for Sebastian Stewart Fish Company for use in Alaskan waters, and the other built for F. H. Brownell, Jr. Each vessel will be powered with a 200-h.p. Hall-Scott motor.

Front of the 8-cylinder, 300-horsepower, fully reversible Union diesel engine built by the Union Diesel Engine Co. of Oakland, California, for the yacht Norab. This plant drives the 110-foot cruising yacht at a speed of 13 miles an hour.

A Motor Barge at San Pedro

Washington-Estep Diesels Effect Economy for American Salt Company

THE successful dieselization of the American Salt Company's Barge No. 60 at San Pedro may result in other Pacific barges being equipped with diesel engines. There are a number of barges on the Atlantic Coast using this very satisfactory form of power.

Barge No. 60 is 149 feet long and has a 30-foot beam. Her stern is square, but she has a pointed bow, similar to a schooner. Her capacity is 600 tons. Crude salt cargoes of this size are transported from San Quentin, Mexico, to San Pedro, a distance of 300 miles.

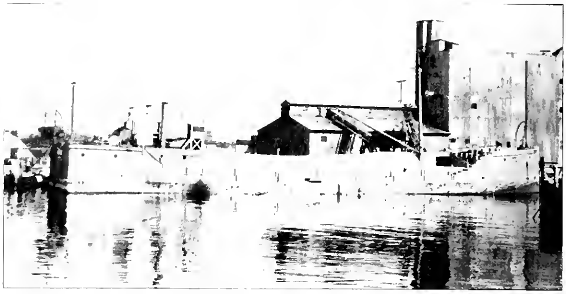
This vessel at one time was powered with two gas engines, but these motors were unsatisfactory and were discarded, after which the barge was towed by tugboats. The cost of this latter form of transportation proved prohibitive; $1500 per round trip to San Quentin.

Two 100-horsepower Washington-Estep heavy duty marine diesels solved the power problem. Before these were installed the engine base was raised and larger timbers laid down. The shaft timbers also were strengthened. Two large wooden skegs were removed and the propellors protected by installing steel skeg bars.

Each diesel has three 10- by 12-inch cylinders. These engines are designed to run at 350 revolutions per minute, but 260 to 280 revolutions per minute have been found to yield plenty of power. The diesels are the 4-cycle type, and how low cylinder compression, 360 pounds. For starting the engines cold, only 100 to 200 pounds of air is needed. Starting air is automatically shut off as soon as the engines start firing. Air enters through the main intake valve instead of through an extra cored hole through the water jacket. This arrangement gives a better flow of cooling water around the valves.

The reverse gear is of the heavy duty type and could be used for hours without heating, because the clutch is the enclosed multiple asbestos friction-lined disk type. Berger air control enables the operator to work the reverse clutch from the pilot-house.

Flexible maneuvering at slow speeds without danger of misfiring is permitted by solid fuel injection.



American Salt Company's barge No. 60 at San Pedro. This barge is equipped with two 100-horsepower Washington-Estep heavy duty marine diesel engines.

The fuel spray valves are the overbalanced type, direct-lift stem, with special mechanical strainer in each fuel nozzle to prevent clogging of the small spray holes.

A tugboat using a diesel engine of the same horsepower, 200, pushed the barge only 3½ miles an hour. It was predicted that she could not make over four miles with her own engines. Instead, she attained 6 knots loaded with 600 tons of salt and 8 knots empty. The two gas engines formerly used would have cost around $3.50 per hour to operate, yet the two diesels use only 38 cents worth of fuel and lubricating oil per hour—$23.00 worth on a round trip. Adding a week's wages for three men—$100—makes a total operating cost of $123 per round trip, compared to $1500 per round trip as a towing barge. Transportation costs, exclusive of overhead, were thus cut from $2.30 a ton to less than 20 cents, by barge dieselization.

Pilot house control enables one man to operate the engines and steer the vessel. He has two helpers. A small auxiliary gas engine drives the bilge pump and anchor winch.

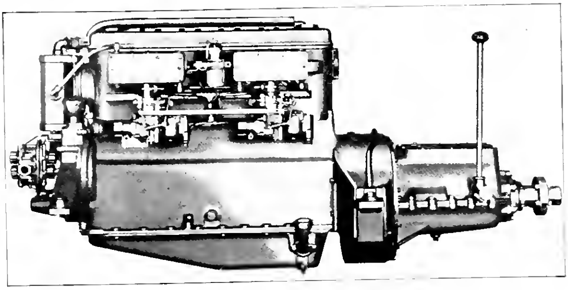
Washington-Estep agents claimed the engines would use not more than 0.4 pound of fuel per brake horsepower, or about 11 gallons per hour. They really consume only 9 to 10 gallons of 27 degree fuel in that time. Twenty-six gallons of Pan-American No. 9 lubricating oil is used on each round trip.

Salt is obtained from a small saline lake about 80 rods in diameter, where it is deposited in granular form. The salt is shovelled in piles and hauled by truck to the shore of a small estuary, where the barge is loaded. The entrance to this lagoon is only three feet deep at low tide, which renders navigation uncertain. A narrow strip of land about a half-mile wide separates the salt lake from the ocean. In order to save trucking and the navigation of the shallow estuary, transporting the product across the isthmus with an endless chain conveyor or aerial tramway is contemplated. At San Pedro the cargo is unloaded with a spiral conveyor, which is operated with current obtained from a pier power line.

A TUNA FISHER

The Mariner, built by Campbell Machine Company for the Monise Brothers has a 350-horsepower Union diesel engine for propulsion and a 35-horsepower Union diesel engine for auxiliary power. She has a 5-ton York refrigerating machine and capacity for 150 tons of iced fish.

Buffalo Boat Motors



The Buffalo-Knight 80-horsepower 6-cylinder motor with reverse gear incorporated.

BACKED by all the prestige which rightfully belongs to the product of a company which has been a pioneer in marine engine building, a new Knight type engine has just taken its place in the motor boat field.

This new engine is offered by the Buffalo Gasolene Motor Co., and back of their wide knowledge of marine engine requirements are the resources and experience of the Willys-Overland Co., pioneer builders of Knight type motors, which assures a happy combination for the boat owner who wants the quiet, smooth-running characteristics of the Knight type combined with the unfailing, dependable service which has made Buffalo marine engines famous.

One Buffalo-Knight is a six cylinder engine with a 3 3/8 in. bore and $4\frac{3}{4}$ in. stroke developing 80 H.P. at 2400 R.P.M. It is capable of operating up to 3000 R.P.M., and will give continuous service over a wide range of speed. It has all the advantages of Knight design. In the Buffalo-Knight double sleeve motor the incoming and exhaust gases move in and out of the combustion chamber through two ports on each side of the double sleeve. The sleeves are placed one inside the other—the inner sleeve forming the walls of the combustion chamber. Another small Knight type engine being introduced at the National Motor Boat Show is the six-cylinder, 2 15/16 bore by 4 7/16 stroke rated at 60 H.P. This has the same general characteristics of the 80 H.P. described above.

Other engines in the poppet valve type to be displayed at the show include the new six cylinder, $4\frac{1}{2}$ x 5 Buffalo-Navigator, which is a 100 H.P. model and a new six cylinder 45 H.P. Buffalo Clipper, which has 3 1/8 in. bore by a 3 7/8 in. stroke. The popular Buffalo Dreadnaught, six cylinder 5 7/8 x 7 200 H.P. and four cylinder $3\frac{1}{2}$ x 5 Navy Model will also be exhibited.

A. W. Lawson represents the Buffalo Gasolene Motor Co., at San Francisco.

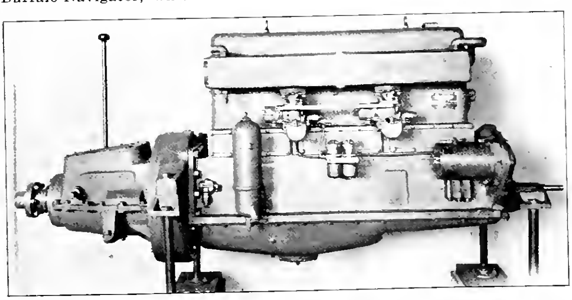
Seattle Ship Chandler Expands

CARL SUNDE, president of Sunde and d'Evers Co., pioneer ship chandlers located in the Colman Dock, announces reorganization and recapitalization of his company, with important changes in personnel and a program of general expansion in celebration of the firm's entry upon its forty-eighth year in business. The capital stock of the company has been increased from $200,000 to $250,000, and a substantial interest has been purchased by Levi C. Oman, widely known among marine interests of the Pacific Coast. Mr. Oman becomes vice-president and general sales manager. The other stockholders and officers are Carl J. Sunde, G. C. Sunde, A. H. d'Evers and D. Daneman.

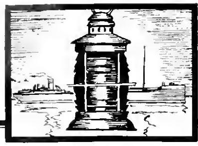
Enlarged space in Colman Dock, where the firm has been located since that structure was built, will be utilized for housing greatly increased stocks of ship chandlery, heavy marine hardware, and fishermen's supplies, and the canvas goods department will be augmented for increased manufacture.

Mr. Oman for the past six and one-half years has been factory representative for several of the foremost manufacturers of marine supplies in the United States, including such well-known firms as Wilcox, Crittenden & Co., Middletown, Conn.; National Lamp Company, Forrestville, Conn.; Boston & Lockport Block Co., East Boston, Mass.; M. L. Oberdorfer Brass Co., Syracuse, N.Y.; Massassoit Manufacturing Co., Fall River, Mass.

Sunde & d'Evers Co. have served the marine trade of the Northwest almost half a century. Their canvas department has outfitted sea rovers from the four corners of the earth and they have served the commercial and fishing fleets of the Pacific Northwest with tremendous quantities of supplies and stores.



Buffalo-Navigator 6-cylinder, 100-horsepower boat motor, with reverse gear incorporated.



Auxiliaries—Ship Supplies—Marine Equipment

Progress in Electrical Propulsion

General Electric Company Reports World-Wide Interest in Electrical Drive for Seagoing Vessels with Steam and Diesel Prime Movers

THE following material, taken from the report of progress in the application of electricity in marine engineering, issued by the General Electric Company, illustrates the way in which the idea of electric propulsion is taking hold of the minds of marine engineers in relation to passenger liners and in many special services.

The passenger liner Virginia, the second of three new electrically-driven liners for the Panama Pacific Line of the International Mercantile Marine Company, was launched August 18 at the yards of the Newport News Shipbuilding and Dry Dock Company and proceeded on her maiden voyage on December 8 to California ports via Havana and Panama. The Virginia is practically a duplicate of the California except for an increase of 12 feet in length, a slight increase in passenger accommodations, and change in the boiler arrangement. The electric propelling and auxiliary equipment is now being built for the third vessel, which is as yet unnamed. It is expected that this vessel will be ready for service either in December, 1929, or the following month.

A 19,000-ton turbine-electric passenger liner Viceroy of India was built in England for the Peninsular and Oriental Steam Navigation Company for service between ports of England, India, and Australia. The British Thomson-Houston Company, an associate of the General Electric Company, built the main propulsion equipment for this vessel, the first of its type to be built in England. This is the first large electrically driven vessel ever built in England. It has a designed speed of 19 knots and is 600 feet long. The main power plant consists of two turbine-driven generators either of which when working alone is capable of driving the ship at a 16½-knot speed.

The control is of the variable voltage type. When operating at maximum power, the armatures of the four main generators and propelling motors are series connected. At reduced speed, any number of generators desired can be cut out of the line.

Pilot house and engine room control is furnished, which permits the ship to be maneuvered either entirely from the bridge or from the engine room as desired. Both the deck and underdeck auxiliaries are completely electrified. The electric deck auxiliaries consist of 12 cargo winches with the latest type of automatic control, one warping winch, and one anchor windlass.

The under-deck auxiliaries, which are electrified throughout, consist of the steering gear, refrigerating plant, ship's ventilating fans, and pumps for the following purposes: bilge, ballast, fire, sanitary, fuel oil transfer, fresh water, lubricating oil, and circulating water. Miscellaneous motors were also furnished for the oil purifiers, machine shops, etc.

Three lightships for the Bureau of Lighthouses were equipped with diesel-electric drive, the first of their type to be so equipped. Heretofore, lightships were powered with steam propelling equipment for use in navigating between their station and the home port, and also to drive ahead against a storm in order not to drag the anchor. Diesel-electric drive, because of its low fuel consumption, permits a much longer stay at the station and also gives an immediate reserve of power for use in emergencies. Power from the main generating set is also used to operate the very powerful anchor windlass equipment installed on these ships.

In the latter part of the year, work was commenced on the construction of diesel-electric propulsion and auxiliary equipment for three additional lightships for service on the east coast of the United States. These will be duplicates of the first three.

The diesel-electrically-driven packet and freight boat, Edward Farrington, operated by the Middlesex Transportation Company, is a good example of how electrification can be used to meet the specific needs of domestic merchant marine. This small craft, which has an over-all length of 132½ feet, is propelled by a 400-horsepower motor which gives the vessel a speed of 12 knots. The boat is called upon to navigate congested harbors and therefore makes excellent use of the pilot house control. All the auxiliaries are completely electrified. The boat is provided with an electric hoist which is also operated from the bridge.

There has also been an extension in the field of application of diesel-electric drive on river towboats of the propeller type. Two such boats were built for use in transporting steel products along the Warrior River in Alabama, for the Tennessee Coal, Iron, and Railroad Company of Birmingham, Alabama. The new boats are of the tunnel stern, twin screw type. The main power plant consists of two diesel-driven direct-current generators, each rated 335 kilowatts, 250 volts, 250 revolutions per minute. The main propelling motors, directly connected to the propeller shaft, are the double type, and each is rated 400 horsepower at 140 revolutions per minute. Power for auxiliaries and lighting, as well as for excitation for the main generator and propelling motors, is furnished by two 40-kilowatt, 120-volt, direct-cur-

rent, auxiliary generators driven directly from the main generator shaft. Diesel-electric drive was adopted for these boats in order to obtain higher efficiency and better maneuvering qualities. They are used on the Warrior River, which is a tortuous one having many sharp bends and which is relatively shallow with a swift current. These boats may be operated either from the bridge or engine room as desired.

The Norfolk County Ferries of Portsmouth, Virginia, have selected diesel-electric drive for their new automobile and passenger ferry boat which is to ply between Portsmouth and Norfolk. The power plant consists of two diesel engine-driven, direct-current generators, each rated 270 kilowatts, and a propelling motor of the double type rated 670 brake horsepower.

The combination harbor and sea tugs Chagres and Trinidad, which are the highest powered diesel-electrically-driven tugs in the world, were placed in service the early part of this year. These boats, which are owned and operated by the Panama Canal, have a capacity of 108 tons of Diesel fuel oil, sufficient for a cruise of 25 days and a range of approximately 7000 miles. They may thus be used in case of emergency for servicing or towing disabled vessels at sea. They are each equipped with a 500-watt radio transmitter with a range of 1000 miles at night, for use when engaging in sea service. The tugs can also be used for fire fighting, being equipped with motor-driven pumps of a capacity of 1000 gallons per minute at a pressure of 100 pounds per square inch.

In ordinary service around the Canal Zone, these tugs are used for towing barges from the dredges to the dumping grounds at sea, and for assisting vessels through the locks. The auxiliary equipment is completely electrified, and consists mainly of a powerful capstan and anchor windlass of the combination type, and an automatic towing machine with an inhaul capacity of 75 feet per minute at 25,000 pounds; an electric steering gear, and miscellaneous auxiliaries in the engine room such as pumps, blowers, and compressors. The tugs have also refrigerating plants.

The main propelling motors are of the double type, and they are built to deliver 900 shaft horsepower continuously at 1450 amperes and 500 volts. The operating speed range at full power is 115 to 150 r.p.m. The tugs were given an eight-hour dock test at 750 shaft horsepower, and also a sea test at 750 and 900 shaft horsepower, previous to their acceptance. The machinery passed all tests easily.

The Compagnia Generale Di Elettricita of Italy is undertaking the diesel-electrification of a combination car and auto ferry for service between Messina and Reggio on the Straits of Messina, to be operated by the Italian Government Railways. This ferry will have the distinction of being the highest-powered electric ferry to be built in the world to date. The propelling equipment consists of six main direct-current generators which are to be directly coupled in pairs to three diesel engines, and two double propelling motors of 2250 shaft horsepower capacity each. The ferry is to be of the twin screw type, driven from one end only, and having a total rating of 4500 shaft horsepower. The control equipment is to be built in America by the General Electric Company at Schenectady.

Another step in the electrification of water transportation facilities in New York harbor was taken by the State of New York in its decision to provide two more electric ferryboats to serve the metropolis. Two steel double-end diesel-electric boats are now being built to run between the city and the Manhattan State Hospital on Ward's Island. These will make a total of twelve electric ferry boats operating in New York harbor. There are in service now six diesel-electric craft, operated by Electric Ferries, Inc., and four of the turbine-electric type, operated by the city. The four turbine-electric ferries have General-Electric equipment.

The power plant on each will consist of two 6-cylinder, vertical, single-acting, 4-cycle, air-injection diesel engines built by the Winton Engine Company. Each engine will be rated 250 brake horsepower, and will drive a direct-current generator rated 160 kilowatts, 250 volts, at 325 revolutions per minute, shunt wound. Complete electric equipment will be furnished by the General Electric Company.

For the operation of auxiliaries, lights, etc., each boat will have two direct-current generators, each rated 20 kilowatts, 125 volts, at 325 revolutions per minute, compound wound. The auxiliary generators will be mounted on shaft extensions of the main generators. Each boat will be propelled by a direct-current, double propulsion motor rated 400 horsepower, 180 revolutions per minute, 500 volts. This motor will consist of two units each rated 200 horsepower, 180 revolutions per minute, 250 volts, shunt wound, and mounted on a single shaft. Control of the electric equipment will be of the variable-voltage type, with control stations in both the pilot house and the engine room, thus allowing the operations of the boat to be governed from either point. The main generator and propulsion motor switchboard will be of the dead-front type, while that for the auxiliary circuits will be of the live-front type.

Both boats were designed by Eads Johnson of New York. They will probably go into service this spring.

General Electric Company, Schenectady, New York, has issued the following bulletins:

GEA 569B. Constant-potential Arc-welding sets.

GEA 881A. General Electric Arc Welder, gas engine driven.

GEA 941A. Type CP, motor driven, center-gear, Reciprocating Air Compressors for railway and industrial service.

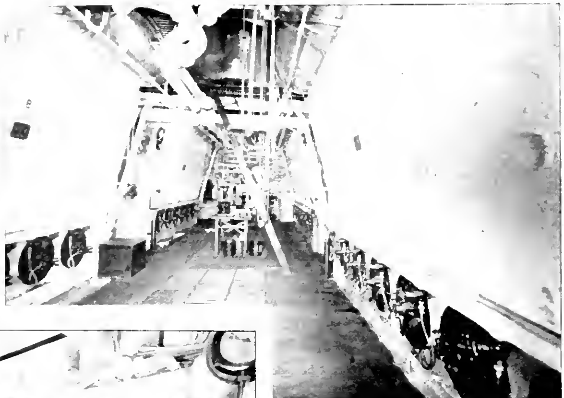
De La Vergne Installation

I. P. Morris and De La Vergne Inc., of Philadelphia, are furnishing the complete electrical and diesel engine equipment for a diesel-electric bulk oil tanker for coastal service for the Tidewater Oil Company.

This vessel will have a length of 255 feet, a beam of 44 feet, depth of 18 feet 6 inches, and will be driven by a 1000 shaft horsepower, 130 revolutions per minute, double-unit propulsion motor operating on 500 volts direct current.

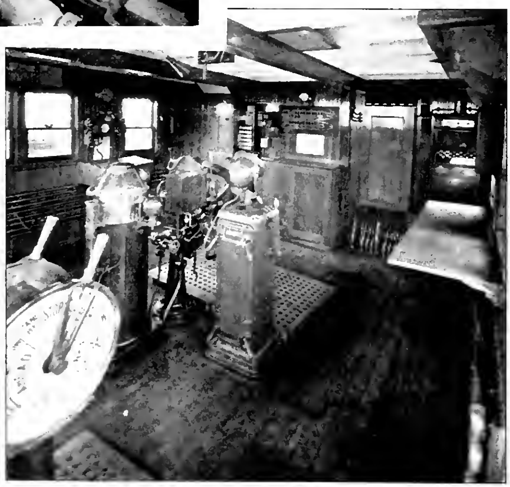
Power for this motor will be furnished by two, 625-horsepower 4-cycle, 225 R.P.M., solid injection De La Vergne diesel engines, each direct-connected to a 410-kilowatt, 250-volt, shunt wound direct-current generator. Auxiliary power will be furnished by an 80-horsepower, 45-kilowatt De La Vergne Diesel generating set.

Modern Equipment on a Turbo-Electric Passenger Liner



Above: One of the fire rooms of the turbo-electric passenger and freight liner Virginia, from a photograph taken at San Francisco, featuring the neat appearance of the new interdeck, superheater type Babcock & Wilcox water-tube boilers.

At left: View on the refrigerator flat of the Virginia, featuring Brunswick-Kroeschell compressors and evaporators and Warren centrifugal pumps. The refrigerating equipment on this vessel is arranged in a particularly neat and convenient installation.



View in the pilot house of the steamship Virginia, looking aft from the forward end and featuring some of the modern devices for safety at sea, with which American passenger liners are being equipped.

On the after bulkhead, from right to left, are shown, first, the Rich smoke detection cabinet for detecting and locating fires in the cargo spaces and other large underdeck compartments. Next is a cabinet containing the electric panel for control of navigating and boat deck lights. Next is the control system for operating the watertight doors. Next is the cabinet of the Derby automatic fire alarm system which protects the passenger accommodations.

On the starboard bulkhead, above the desk, is the Cory anti-noise telephone for communication with the engine room; and in the lower left corner is one of the transmitters for the Cory engine room telegraph.

In the center of the picture may be seen the Sperry automatic helmsman with gyro-compass repeater mounted on top, the Hyde telemotor, and the standard Kelvin binnacle and magnetic compass.

The fire detection and fire alarm systems were supplied by Walter Kidde & Co.

Latest Development in Buda-M.A.N. Marine Diesel Engine

THIS diesel marine engine is manufactured by The Buda Company, Harvey, Illinois, under license and to the patents of the Maschinenfabrik - Augsburg-Nurnberg A. G. of Germany, commonly known as the M.A.N. Company, in whose shops Dr. Rudolph C. Diesel built his first engine over 30 years ago. The demand for high-speed, light weight, diesel engines for submarine service opened the way for development, and the success obtained with the submarine engines indicated greater possibilities in other lines, so that an engine suitable for cruisers, auxiliaries, yachts, and small craft was developed and sold to the commercial trade in Germany, where it proved out in actual service. The American engine is an adaptation of the highly developed M.A.N. engine to American standards of construction and practice; no deviation being made except to facilitate production and servicing.

Details of Construction of the New Buda-M.A.N. Marine Diesel Engine

The crankcase and cylinder housing are of boxed construction cast integral. This produces a rigid and light design, which contributes to smooth operation. Large hand holes with suitable covers are provided in the side of the crank case for inspection of bearings and connecting rods. Each cylinder proper consists of a grey-iron inserted sleeve readily removable so that it may be renewed without difficulty. Cylinder heads are cast in pairs and are detachable. The inlet and exhaust valves are located in the cylinder heads and are operated by rocker arms and push rods actuated by a cam shaft which is assembled in the crank case. The valve tappet adjustments can be conveniently made by removing the cylinder head covers, which leaves the rocker arms in plain view without any accessories or other parts in the way.

The valve-in-the-head design is desirable for obtaining the desired compression space for the most efficient pressures. The inlet valve has an integral deflector on the head which, with the angular direction of the fuel spray, produces the necessary turbulence for complete mixture of air and fuel necessary to produce clean combustion.

Each cylinder is fitted with two injection nozzles, one on each side of the cylinder. The arrangement of nozzles gives simplicity of cylinder head construction, and permits, without difficulty, the largest possible area for the intake valves. The nozzles are of the open and airless-injection type, having one single opening. They are interchangeable and can be as easily removed and cleaned as spark plugs. Cleaning is required no oftener, for the fuel is carefully filtered before entering the fuel pump, from which it passes through to the injection nozzles.

Accessories.

A tachometer drive with S.A.E. connection is fitted to the engine. Provision is made for motometer, so that operator sees at all times the temperature at which engine is running. The heavy duty reverse gear is pressure lubricated and is easily accessible for adjustments by removing the hand hole cover. A fuel supply pump is furnished to bring the fuel from the main storage tank or tanks to the day or running tank. The controls on the fuel pump, compression release, and regulation valve on water pump are arranged so they can be handled either by remote control or at the engine.

Fuel Pump.

The fuel injection pump is mounted on a bracket integral with the crankcase, and is positively driven by a gear in mesh with the timing-gear train. Independent fuel pumps for each cylinder are grouped in a common housing and deliver fuel in proportion to the load through the action of over-flow valves. A cam is supplied so the operator can test out each individual pump to see if it is working properly when the engine is running.

Governor.

The governor, which operates directly off the fuel pump, is built as an integral part of the pump and is arranged so as to make it impossible for the operator to increase the maximum rated speed.

Cooling.

The cooling system resembles the conventional type that is found in marine gasoline engines, the water pump being of the geared type and driven from the timing-gear train.

Lubrication.

Forced-feed lubrication to all moving parts is a feature. This is accomplished by a dual-geared pump operating a dry-sump system. Oil is taken from the supply tank mounted on the flywheel housing, from where the pressure pump forces it through the filter. From the filter it is taken to a main oil distributing line in the crank case where it is forced to all crank shaft and cam shaft bearings, then through the hollow crank shaft to the connecting rod bearings, and to the wrist pins through the drilled connecting rod. The crank shaft is drilled at the reverse gear end to provide lubrication under pressure to all moving parts in the reverse gear. It is also forced to the rocker arm assembly and to the fuel pump. The timing gears are lubricated by a jet of oil directed to each pair at the point where the gears mesh. The oil from the main bearings and all other moving parts drains to the bottom of the sump pan, from which the sump pump returns it through a screen to the oil cooler and then to the supply tank. The constant oil pressure is maintained and protected by safety valves. A well-designed filter is incorporated in the oiling system to catch all impurities in lubricating oil.

Operates on the Airless-Fuel-Injection Principle.

The engine is designed in accordance with the airless-fuel-injection principle (spray atomization); that is, the fuel is injected into the combustion chambers by means of pressure from the fuel pumps and without the use of compressed air or precombustion chambers. There are no hot spots, hot surfaces, or plugs which have to be previously heated or inserted. The airless-injection system makes it possible to start a cold engine in a short time and without any special preparation. All fuel injection valves are of the open nozzle type, thus dispensing with check valves and other movable parts. A special design of filter is furnished for filtering the fuel oil, the design being such as to prevent impurities from reaching the fuel lines or plugging up the nozzles.

Simple Method of Operation and Small Attention Required.

The Buda-M.A.N. marine diesel engine operates on the four-stroke-cycle principle. Fuel is injected directly into the combustion chambers, and a constant volume of air is taken into each chamber with the intake stroke.

Fuel is metered by the pumps in proportion to the speed and power required, and the pumps are connected with the governor so as to control the direction of fuel injection according to a specific crank angle proportionate to the speed and load. This produces about the same effect as the butterfly valve in a carburetor. The fuel pumps also are arranged so that injection can be advanced or retarded according to speed, which eliminates the high stresses ordinarily produced in diesel engines under acceleration, and insures smooth and quiet operation.

A safety governor prevents overspeeding beyond the maximum, and provision is made for manual as well as governor regulation.

Electric motors are supplied for starting duty, and a compression release on engine is incorporated to provide easy starting.

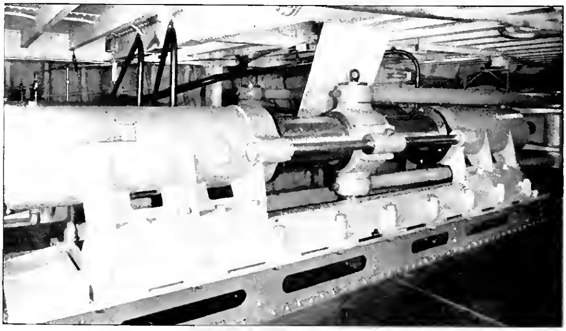
Owing to the simple construction, the method of fuel injection, the lubricating system, and the accessibility of parts, resulting in a high degree of reliability, a minimum amount of attention is required when the engine is running. All operating instructions can be acquired quickly and easily.

Pacific Coast Distributors.

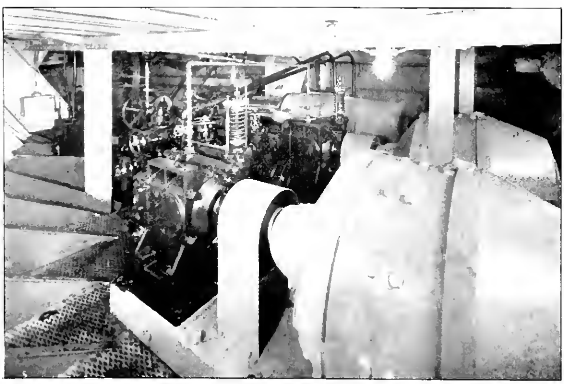
Owners and builders of yachts, cruisers, workboats, and similar craft, together with others interested in marine engines, will have an opportunity of inspecting the new Buda-M.A.N. high speed, lightweight, full-diesel, marine engine in the showrooms of the following Buda distributors on the Pacific Coast, where it will be displayed during January, February and March: Richard Froboese Co., Seattle; Dahl Electric Co., San Francisco; and Ets-Hokin & Galvan, Wilmington, California.

Hyde Steering Gear on Virginia

THE two illustrations on this page are made from photographs taken on board the steamship Virginia just after her arrival at San Francisco on her first intercoastal voyage. The upper picture shows one of the two pairs of hydraulic cylinders for operating the rudder. The lower picture shows the two electrically driven, hydraulic pumps and the bypass and control mechanism for the steering gear of this fine turbo-electric liner.



The steering gear, as shown in the illustration, is of the hydro-electric type. Four opposed hydraulic cylinders operate two plungers, each plunger having two cylinders made up in a self-contained assembly on a single bed plate. From center of each plunger two connecting links run aft to the rudder crosshead. Oil under pressure is supplied to these cylinders by means of dual pumping units consisting of the constant speed electric motor coupled directly to a variable stroke pump. The pump is fitted with a pressure regulator so that either pumping unit can be used as desired. An automatic electric follow-up mechanism is controlled by the trick wheel at the steering gear, and is also controlled by hydraulic telemotor from the pilot house. This is the type of steering gear that has been giving such excellent satisfaction on the turbo-electric line California and on many other liners.



Elwell-Parker Tractor Crane

IN many plants a crane tractor is needed not only to haul trailers but to provide facilities for loading the trailers drawn behind.

Elwell-Parker provides such a machine in the new heavy duty 6000-pound carrying capacity 1200-pound crane lift capacity tractor. This tool has a large capacity battery to meet tractor haulage conditions.

The crane is of the revolving and luffing type. Its double drum hoisting unit which lifts or lowers either the boom or hook is motor powered and driven from the same battery supplying power to the propelling motor.

The new heavy duty 1200-pound lift, 6000-pound carrying capacity Elwell-Parker crane tractor.

The main truck frame is heavily built from operator's pedals to end of platform. When the tractor is not used for towing purposes its 41 x 80 inch platform is available for direct loading. In the machine tool, shipbuilding, automobile and similar industries this tool with its large tractor power, large wheels and clearances goes out into the storage yard and brings the large casting into the shop and places on machine planer bed, etc. All Elwell-Parker safety features and alloy steel drive mechanism, as well as enclosed fuseless motors are employed in its construction. The wide drive and trail tires assure good traction even on poor runways.

A New Type of Port Terminal

SKYSCRAPERS promise to become an important factor in the future development of water transportation, according to Walter W. Ahlschlager, architect of the new Chicago Tower, which is the first skyscraper to have pier facilities.

"The Chicago Tower will have a pier on the Chicago River, making it possible for vessels to unload their cargoes directly into the building," Ahlschlager said, "and I see no reason why such development cannot be carried on in other skyscraper structures fronting on waterways.

"This new skyscraper is not an industrial building but it is a multiple purpose structure. It houses nine various classes of tenants; and one of its facilities is a warehouse in the sub-basement which has seven freight sidings and pier connections. The upper part of the structure is to be devoted to sales and exhibition space and high-class offices. Thus we have a building which is a high-class structure, but which uses its proximity to the waterfront to make this means of transportation available to its tenants.

"In reality this building will be a seventy-five story "free port," for vessels may unload their cargoes into the warehouse of the building and the goods may be reshipped by the water route without ever having had to actually pass through Chicago. This removes one step in the present system of distribution by eliminating cartage through the traffic-congested streets of Chicago. This increases the economy of water transport and makes a combination of water and rail rates cheaper than the average combined rate.

"The plan which has been adopted for The Chicago Tower is new and unusual, but in my opinion it will be adopted for skyscrapers elsewhere. Values in many of our American cities have increased to such a point that waterfront property can no longer be but partially utilized as it has been for generations. It is practical to erect skyscrapers on the waterfront, which may have their lower portions devoted to warehousing and shipping while their lower portions provide sales, exhibition, and office space of the highest grades.

"Chicago and New York present the best examples of wasted values along the waterfronts. When property values were low it was feasible to build warehouses of one story and to waste a great deal of space. Now the residential and business districts are crowding in upon the waterfront, and pier properties which might be utilized as sites for skyscrapers are increasing in value. It is my prediction that another generation will see our waterfronts developed into greater utility and greater beauty. This development will of course mean that many industries which are now failing to take advantage of the lower water rates will avail themselves of the advantages of marine transport."

TRADE NOTES

C. W. Martin, former manager of the **Frigidaire Company** at Flint, Michigan, has been appointed Pacific Coast Manager of the organization, according to an announcement made by R. F. Callaway, branch manager. Mr. Martin is in charge of all branch operations west of the Rocky Mountains. Connected with the Frigidaire Corporation since 1916, Martin was at one time with the Detroit branch.

Yale and Towne Service Building

The Towne service building, built for the service of the employees of the Yale and Towne Company, with funds provided by the late Henry S. Towne.

FUNDS for the erection and care of a building to be known as the Towne Service Building, were provided through a special bequest in the will of the late Chairman of the Board, Henry R. Towne, and this building represents his plans and purposes for the progression and advantage of the company's employees, both now and in the future.

The structure is modern in construction and up to date in heating, lighting, and ventilation facilities, and will admirably serve as a recreational center for the thousands of employees of the company.

Of colonial brick, the handsome Georgian exterior is trimmed with Indiana limestone, and the attractive lobby is of marble. The building consists of two stories and basement. The main floor houses the works hospital, dental clinic, and industrial relations bureau. The second floor has a large auditorium, gallery, and stage, with a seating capacity of 400. A commodious library is also located on this floor. In the basement are four bowling alleys with new and complete equipment, and with a gallery for spectators at the end of the hall. Two new pool tables are also installed in one section of the basement.

The auditorium provides an adequate meeting place and recreational and dramatic center for the various plant organizations. A motion picture outfit will also be installed. Cost of construction and the sum necessary for the maintenance of this building approximates half a million dollars.

Ralston R. Cunningham

OF UNUSUAL interest to the marine trade in the Pacific Northwest is the appointment of Ralston R. Cunningham as successor to Levi C. Oman as their representative by a number of eastern manufacturers of marine supplies. Mr. Cunningham takes over their lines on February 1st, when Mr. Oman assumes his new duties as vice-president and general sales manager of Sunde & d'Evers Co., pioneer ship chandlery dealers.

Mr. Cunningham is one of the best known men along the Seattle waterfront. He is a brother of Edward Cunningham, general manager of the Pacific Marine Supply Co., and Allan Cunningham, manufacturer of marine electrical equipment. For the past twelve years he has been in charge of the marine engine department of the Pacific Marine Supply Company. With the exception of two years during the war period, when he served with the Field Engineers, 117th Regiment, famous Rainbow Division, in France, Mr. Cunningham has been selling engines and equipment to buyers of marine supplies for almost two decades. Few men are better known to yachtsmen and commercial boat owners from California to northernmost Alaska. He is an ardent yachtsman, being a member of the Seattle Yacht Club and the Queen City Yacht Club.

The manufacturers, who have selected Mr. Cunningham as their representative, include Wilcox, Crittenden & Co., Middletown, Conn., general ship chandlery; National Marine Lamp Co., Forrestville, Conn., marine lamps, Boston & Lockport Block Co., East Boston, ship's tackle; M. L. Oberdorfer Brass Co., Syracuse, N.Y., pumps; Massassoit Manufacturing Co., Fall River, Mass., calking cotton and waste; The Leach Company, Oskosh, Wis., logging tools. Mr. Cunningham will look after their interests in Oregon, Washington, British Columbia, and Alaska. He will maintain headquarters at 511 Maynard Building, Seattle.

Prescott Worm-Drive Tractors

THE illustration herewith shows part of the tractor fleet of the Seaboard Stevedoring Corporation on the Norton-Lilly dock at San Francisco, where this fleet of tractors is giving excellent service. This very efficient gasoline driven tractor is manufactured by the Prescott Company at Seattle, Washington. Its ability to turn in small space and to push or pull heavily loaded trailers has made it a very useful equipment in congested docks and industrial plants. The Prescott Company is represented in San Francisco by Hough and Egbert, Inc.

Marine Insurance

Edited by JAMES A. QUINBY

Something New in Damage Awards

Third Circuit Divides Damages Unevenly

IN land law, the doctrine of contributory negligence decrees that a party who is in any degree at fault may not recover his damages in a collision case. The law of the sea, as administered by our courts of admiralty jurisdiction, has long followed a rule which, in its arbitrary directness, has accomplished a more equitable result. This is known as the "divided damage," or "both - to - blame" rule, and provides that where both vessels are at fault in a collision, each shall recover half its damages from the other.

While the rule has undoubtedly resulted in some measure of injustice where the faults of one vessel were more flagrant than those of the other, the results have been satisfactory in the majority of cases. The awards are definite; the expectation of a 50-50 break has resulted in a greater number of settlements out of court; and courts have been relieved of the tedious and delicate task of weighing comparative faults.

"Both to Blame" Doctrine Modified.

It has remained for the Circuit Court of Appeals of our Third Circuit to depart from this long established rule in the recent case of A. H. Bull Steamship Co. vs. steamship Manchester Merchant. The facts of the case, so far as can be ascertained from the customarily conflicting testimony, offer no unusual features. To quote from Judge Wooley's opinion:

"The ships, each with its own pilot and moving under its own power at six or seven knots, observed each other when about a mile apart. Except two steamers bound down stream and a ferryboat bound across stream which the Margaret passed shortly after starting, the river between the Margaret and Merchant was clear of shipping. Approaching at half speed, all the time in full view of each other, they exchanged passing signals when about a half mile apart. The Margaret then put her wheel to starboard and the Merchant put hers to port with the result that they laid courses along two sides of a triangle and naturally met at the apex; the stem of the Margaret hit the port beam of the Merchant on her Plimsoll mark precisely amidship and the Merchant, continuing on, came within a few feet of piling up on the piers.

"It is hard to believe, yet that is what happened."

Conflicting Testimony

The Margaret's witnesses testified that she was upward bound, a little to the eastward of the channel when she saw the Merchant about a mile away, about three points off her starboard bow, even further eastward of the channel. Reducing her speed to half ahead, the Margaret gave the two-whistle signal for a starboard to starboard passing, to which the Merchant gave an assenting answer. The Margaret then put her wheel slightly to starboard with the intention of moving to port, away from the Merchant. The Merchant, contrary to signals, suddenly sheered to her own starboard, across the bows of the Margaret, which struck her amidships, after taking the usual last-minute steps to avoid collision.

The Merchant's witnesses claimed that their vessel was to the westward of the channel, which made the Margaret bear on the Merchant's port bow as they approached. When about half a mile apart, the first signal was given—a one-blast whistle by the Merchant, which was repeated about a minute later. To both these signals the Margaret countered by a two-blast whistle. As to the conflicting nature of the testimony, the court

THE BOOTLEGGER'S BARRISTER

I got myself in trouble for a sellin' bootleg gin
And I hired a famous lawyer for to get me out again
I know that he was famous, for upon his door I saw
"Attorney, Proctor, Advocate; Counsellor at Law."
When I had told him all the facts—(a part of which were true)
I asked if I were guilty and if so what should I do?

The lawyer said, "I've never read in law or equity
Of any problem half so hard as that you've given me.
Some judges hold your chances slight
While others think that you are right.
The cases disagree."

But when the scrap was over and I'd pungled up my fine
I saw no way that I could pay this lawyer friend of mine.
And so for fee I sent some 'skey (a case of Hardly Dry)
A case of Sherman Island Scotch, a case of rock and rye.
That night I visited my friend, when all the town was still—
I called upon my barrister, and found him very ill.

The lawyer groaned, "I've never known, in law or equity
Of any cases half so hard as these you've given me.
But one thing I can testify
I'll tell the world before I die—
Your cases disagree."

J. A. Q.

makes the following comment:

"The uncertainty that arises from the stories told by the two ships is due to the inclination of seamen, perhaps through a sense of loyalty, to swear by their own ship and to the difficulty in finding the truth when, as here, two groups of witnesses of equal credibility and equally interested give testimony that is wholly contradictory. Light therefore must be sought elsewhere. So we turn to the tugs to hear what they have to say."

The court then examines the testimony of two tugs which were in the vicinity, the Bering and the Harry M. Wall, and concludes that their testimony is no more reliable than that of the principal vessels. Considering the actions of the four vessels, the court says:

"The only evidence from the acts of the four craft that would justify a port to port passing is that of the Merchant alone. Assuming the acts of each boat were prompted by good seamanship or inspired by the desire for self-preservation, and assuming, as we must, that at least one was gravely at fault, the maneuvers of the Wall and Bering—two boats without financial interest in and what was about to happen—bespeak a situation in which a starboard to starboard passing was expected and the Margaret's signals as testified to and acted upon by the Wall and Bering showed that she concurred in their judgment. Accordingly we find as facts that the Margaret held a course near the center of the channel; that aside from any confusion or illusion arising from the bend in the river, the Merchant was well to the eastern side of the channel and therefore on the Margaret's starboard and in such relation to the Margaret as to justify a starboard passing.

"Nor was the Margaret blameless. She could see what was happening and what was about to happen just as well and just as far ahead as the Merchant. Accepting as true, for the moment, her contention that starboard to starboard passing signals had been exchanged between her and the Merchant, she saw the Merchant when, disregarding those signals, she began to lay a course across the Bering's bow which was across her bow also, yet she kept on and did not reduce speed or reverse engines until the situation was so bad as to call for danger signals, and that, as testified by witnesses aboard the Margaret and as recorded in her log, was only a minute before the collision. We doubt that the Margaret could, at a sustained speed, have maneuvered out of the peril, but we are satisfied that the situation was such as to prompt a cautious navigator to slow down before she did. Had she reversed her engines only a few seconds sooner and at that time made her maneuver to starboard she, doubtless, would not have hit the Merchant. As it was, she almost missed her. Though clearly the situation was not of her making, the duty rested on the Margaret to stop when she had opportunity to see and time to act. Finding that she had both and did not act with the promptness the situation demanded, we hold, on her own showing, that she too was at fault.

Merchant Most to Blame.

"While we hold the Margaret at fault in not promptly slowing down when the situation of danger became apparent, we also hold that, because of the major and primary fault of the Merchant in creating the situation, the Margaret was not equally at fault. Therefore, appraising the concurrent fault of the two ships as fairly as we can, we direct that the decree allowing each ship to recover from the other one-half the damages sustained be modified by allowing the Margaret to recover three-fourths of her damages from the Merchant and the Merchant one-fourth of her damages from the Margaret, with the provision, however, that, because of a probable difference in damage sustained by the two ships, the Merchant shall not in any event recover from the Margaret a sum greater than that which the Margaret will be entitled to recover from the Merchant. When thus modified, together with a similar modification in respect to the libel of Sunkett, the decree will in all respects be affirmed; costs in both trial and appellate courts on the libels filed by the two ships to be taxed one-fourth against the Margaret and three-fourths against the Merchant, and costs on the libel filed by Sunkett to be taxed against the two ships in the same proportion."

"... and the Rider Supersedes the Printed Form."

Like the age-old difference between blondes and brunettes, and the time-honored argument between masters and chief engineers, the inconsistency between a typed rider and the body of a policy is one we have always with us.

The latest example of such internal dissension is dealt with in the case of the Dudley, 1928, A.M.C. 1806. It seems that the Globe & Rutgers insured L. R. Connett & Co. for one year against the usual marine perils in connection with the barge Dudley. The body of the policy provided that the "interest of the assured in this policy or any part thereof or in the property insured or any part thereof is not assignable unless by

the consent of this company manifested in writing and in case of transfer or termination of any such interest of the assured in the property aforesaid, either by sale or otherwise. Without such consent, this policy shall from thenceforth be void and of no effect."

Having thus gained considerable yardage in the right direction, the insurer proceeded to run toward his own goal by inserted a typed rider naming the assured as "L. R. Connett & Co., Inc., for account of whom it may concern."

Shortly after taking out the policy, Connett & Co., without obtaining the consent of their insurers, sold the Dudley to the Gildersleeve Shipbuilding Corporation. Upon the destruction of the barge by reason of a peril assumed by the policy, the insurers denied liability on the ground that the named assured, Connett & Co., were not prejudiced by the loss.

Ambiguity Resolved Against Insurer.

The New York Supreme Court held that the insurer was liable under his policy.

"It is an established rule," runs the opinion, "that contracts of marine insurance are to be liberally construed in favor of the insured. Duncan vs. China Mutual Ins. Co., 129 N.Y. 237. It is my opinion that the very purpose of stating in the typewritten rider that the insurance was for account of whom it may concern was to do away with the printed provision in the policy form in regard to the prohibition against change of interest. The technical phrase "for whom it may concern" or any other terms of equivalent designation or import in a marine insurance policy are general words and embrace the interests of any person whatever who may ultimately appear to be concerned, if such was the intention of the party effecting the insurance, and any person coming within that category who subsequently chooses to ratify or adopt the policy may obtain the benefit of it. The phrase advises the insurer and the insurer accordingly knows that the party in whose name the policy is issued intends other interests than his own to be covered and that others are or will be interested at the time of a loss in the property insured. It indicates that the policy shall apply generally so as to cover the interest of those who at any time during the pendency of the risk by subsequent ratification or adoption take advantage of the policy to protect their interest or interests in the property insured, unless it appears from extrinsic evidence that the person directing the policy to be effected intended at the time so to confine the insurance as not to embrace such interest. Such phrase carries an agreement or covenant on the part of the insurer to pay any loss to all persons whose interests were so intended to be covered and that the named insured and others interested might join in an action to enforce the policy in case of loss. Hagen vs. Scottish Union Ins. Co., 186 U.S. 423; Hooper vs. Robinson, 98 U.S. 528; Duncan vs. China Mutual Ins. Co., 129 N.Y. 237; Burrows vs. Turner, 24 Wend. 276; Joyce on Insurance, 1917 ed, vol. 2 sec. 619; vol. 5 sec. 3609; 38 Corpus Juris p. 1027.

"The language of the rider, in my opinion, clearly expresses an intention upon the part of the insured that he intended that all the title and interest in the scow should be protected by this insurance in the hands of any person to whom the assured might transfer the same or any portion thereof during the current term of the policy. Had the intention of the assured been only to protect his own interests, the policy naturally would have been taken out in his own name, omitting the qualifying phrase "for account of whom it may concern." The typewritten rider is clearly inconsistent with the printed condition in the policy form itself as to change of interest, and I hold that the typewritten rider displaced and nullified the change of interest clause in the printed policy form."

Mixed Cargo

We see by the papers that the Webster Street Bridge in Oakland is being removed. The Lancaster and several other vessels have been trying to accomplish that result for lo! these many years, but all they could do was knock it off its base now and then.

* * * *

We are indebted to our good friend Bill Henderson for a copy of the Antwerp Marine Insurance Policy form of July 1, 1859. The form is still in use, and, with the addition of the so-called "Clauses of 1900," makes a very fair policy indeed. One of the supplements contains instructions to be followed in case of damage or shortage. With very slight changes, these would look well in our local policies. The instructions run as follows:

"If, at discharge of the goods, these show traces of damage or theft, having been broken open, or under all other conditions covered by the terms of the insurance policy, the consignee is to conform to the following instructions, under penalty of nullification of all claims against the insurers:

Make legal protests against the carriers (captains or railroads), and if possible against the unloaders, and make them liable for the damage caused.

Claim immediately the intervention of the average adjuster mentioned on the policy. Failing an average adjuster, get in touch with the chamber of commerce,

marshal, or other competent local authority.

By express agreement verifications of damage and theft have to be made by the agent of the insurers or competent authorities within eight days following the discharge of the steamer or freight car, under penalty of forfeiture."

* * *

The Marine Insurance Study Class of the Association of Marine Underwriters of San Francisco held its seventh meeting of the year on December 17, at which time the members were addressed by John Waddington, secretary of the Board of Marine Underwriters, and T. W. Reimers of the Maddux Air Lines.

Mr. Waddington, who in his earlier days was connected with both the underwriting and brokerage activities of Lloyds, delivered an interesting description on the nature and function of Lloyds, London, pointing out that while there is such a thing as "The Corporation of Lloyds,"—a sort of executive committee—the underwriting is carried on by individuals and the underwriting room is operated upon a plan similar to that of our stock exchange. Mr. Waddington gave a brief resume of the history of the organization from its coffee house days to the present time and drew a word picture of the manner in which policies are presented and signed by the underwriters.

The second speaker of the evening, Mr. Reimers, discussed the Development of Commercial Aviation. His remarks were illustrated by a very interesting set of motion pictures, some of which showed the earlier flights of the Wright brothers and other pioneers in the field of aviation.

CALL IT GENERAL AVERAGE

Whenever an unfortunate vessel arrives with fire and water damage, due to attempts at extinguishing fire on board, there is usually a tendency to include as much of the damage as possible under the head of general average. This is quite logical, if an adjustment is drawn up, since the adjuster's fee has a very definite and intimate relation to the amount of the general average.

Where there has been no damage to the ship, however, there is not the urge to draw up an adjustment, especially in cases where the damage is slight in other quarters.

In the Taurus, 1928 A.M.C. 1587, the vessel suffered a fire in her coal bunkers, which was extinguished by steam and water. Upon reaching Boston, certain hides coming out of No. 3 hold were found damaged by moisture. The insurers paid the loss, and filed a libel in the United States District Court for the Southern District of New York, our old friend Forrest E. Single being the advocate for libelant.

The libel was based upon the assumption that the moisture damage to the hides arose from the water used in extinguishing fire, and should consequently be made good in general average.

Commissioner Putnam, to whom the case was referred for findings of law and fact, found that the hides were damaged by sweat, and held that no allowance in general average was justified:

"In a northerly voyage, late in the autumn," runs the opinion, "damage by wetting, or spots on susceptible cargo, indicates an omission to keep the goods protected from the dripping from beams, as well as the more harmful contact with the skin of the ship. The hides and skins unladen at Boston appear from the mate's stowage plan to have been further away from the fire. And libellant's cause of action depends wholly on proof that the insured's loss under libellant's policy was caused by such efforts to quench these bunker fires.

"On February 18, 1915, the day that followed the filing of the libel herein, there was also filed in this District a libel by Alfred G. Thornton and others against this same steamship Taurus claiming $5,260.49 as damages to a shipment of hides and sheep skins on this same voyage. That cause came to be heard by the Honorable H. G. Ward, whose opinion quoted from entries in the Taurus log book as follows:

'The water poured over the burning coals drained into the engine room bilge and stoke hole, and was immediately pumped out, never raising above the tank tops. It was moreover impossible for water, which had been applied to the coal, to come in contact with any cargo, as there were watertight steel bunkheads, both fore and aft of the engine room compartments, in which were the between deck bunkers.'"

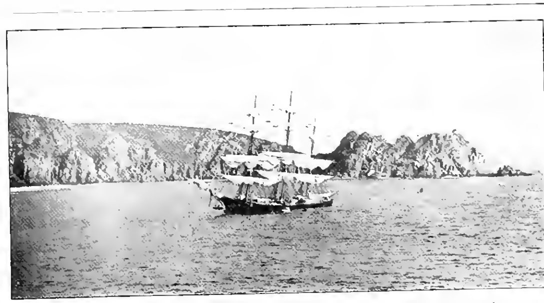
(We rise to point out at this time that the name "Taurus" is Latin for "bull.")

MARINE SUPERINTENDENT MACKAY RADIO

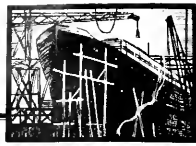
ANNOUNCEMENT is made of the appointment of Mr. H. E. Coyle to the position of marine superintendent of Mackay Radio and Telegraph Company.

Mr. Coyle will have charge of all matters pertaining to ships' radio equipment, radio compasses and repairs and service to both.

Mr. Coyle is already well known in shipping circles as a doctor for sick radio equipment and radio compasses, with a marine repair gang on tap twenty-four hours per day.



An interesting view showing the American ship Granite State, stranded on the coast of Cornwall, England, November, 1895. She was afterwards broken up in heavy gales. The Granite State was built at Kittery, Maine, by J. Neal, 1877.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Bids Opened On Seattle Steamship

Bids for the construction of a steel passenger and freight steamship for the Northland Transportation Company of Seattle were opened January 14 by Lee and Britton, naval architects with offices at 22 Colman Dock. The bids were as follows:

Lake Washington Shipyards, Seattle, $269,000; delivery August 1.

Moore Dry Dock Co., Oakland, $297,388; delivery 8 months.

Albina Marine Iron Works, Portland, $298,700; delivery 7 months.

General Engineering & Drydock Co., Oakland, $302,000; delivery 9 months.

Bethlehem Shipbuilding Corp., San Francisco, $347,893; delivery 7 months.

New London Ship & Engine Co., New London, $640,000; delivery 1 year.

The vessel is to be used in the Puget Sound, Southeastern Alaska service of the Northland Transportation Co., which is a subsidiary of W. B. Foshay Company of Minneapolis.

The vessel, which is the first of three planned for this service, is to be 186 feet long, 35 feet molded beam, 21 feet 6 inches depth; powered with two 500-horsepower diesel engines, giving a speed of 12 knots. All auxiliaries will be electrically driven, including winches, capstan and windlass, and refrigeration machinery for cold storage cargo space. The vessel will have accommodations for 56 passengers. She will be of steel construction to the boat deck. Bids were received January 5 from Pacific Coast and one Atlantic Coast yard.

Bids Called for New Seattle Ferryboat

Bids were opened January 21 by the Kitsap County Transportation Company, Seattle, Captain John L. Anderson, president, for the construction of a steel ferryboat for operation on Lake Washington or Puget Sound. The boat is to be 200 feet long, 57 feet 6 inches breadth on deck, 14 feet 6 inches depth. She will be designed to carry 90 automobiles and 1000 passengers. The vessel is to have either diesel-electric or direct diesel drive and from 1000 to 1500 horsepower, in order to give a speed of 15 knots.

It is estimated that the cost will be in the neighborhood of $200,000, and bids have been submitted by yards all along the Coast.

Tankers for Coastwise Trade To Be Built

Angelo Conti, 11 Broadway, New York, has called for bids to be submitted for the construction of four single-screw motor tankers for coastwise trade. The vessels are to be 235 feet between perpendiculars, 38 feet 6 inches beam, 15 feet depth, 1600 tons displacement. They are to be powered by diesel engines developing 1000 shaft horsepower and giving a speed of 11 knots.

Auxiliary Schooner for South Seas Cruising To Be Built

C. Padgett Hodson, naval architect with offices in the Kohl Building, San Francisco, has completed plans and specifications for the construction of an auxiliary powered schooner for pleasure cruising, with the particular object of cruising from San Francisco to the South Seas. The vessel is for a San Francisco yachtsman and will be 95 feet long. Full particulars, with plans, will appear in the March issue of this magazine.

Eastern Shipping Firms Plan New Tonnage

According to reports from the East, the Pittsburgh Steamship Company of Cleveland is contemplating the construction of two 600-foot Great Lakes freighters.

It is also reported that the Eastern Steamship Lines, Inc., India Wharf, Boston, is planned the construction of additional tonnage.

It is reported that G. A. McNicholl, general passenger agent of the Canadian National Railway, Vancouver, has stated that plans and specifications have been prepared for two passenger and freight steamships for the British Columbia coastwise trade, to be larger than the Prince Rupert and Prince George, and to be equipped with the most modern appointments. They are to be ready for the 1930 season, according to reports.

Pilot Boat for Los Angeles Harbor

The Los Angeles Harbor Board has extended the time for the opening of bids for a new pilot boat in order that a number of prospective bidders might submit their offers.

The boat is to be of wooden construction, 60 feet over-all, 14 feet 6 inches molded beam, 4 feet 5 inches draft. She is to be powered with 2 or 4-cylinder diesel engines to give a guaranteed minimum speed of $12\frac{1}{2}$ knots, with diesel auxiliary engine electric light generator.

Dollar Plans Materializing

It is anticipated that plans for the three new vessels for the Dollar Steamship Company of San Francisco will be announced shortly.

These plans are being very carefully worked out for the reason stated by Captain Robert Dollar recently, namely, "We are attempting to anticipate the demands of American travelers for the next 15 years. America is traveling, and we are ready to spend $21,000,000 immediately to provide for the demand." The vessels, of course, will be built under the provisions of the Merchant Marine Act, 1928.

Bids Called On Coast Guard Cutters

The U. S. Coast Guard, 14th & .E. Street, N.W., Washington, has issued a call for bids to be submitted on the construction of Coast Guard cutters Nos. 50, 51, and 52, to be opened February 21.

The chief characteristics are to be steel hull length over-all 250 ft.; molded beam 42 ft.; displacement at 15 ft. draft, about 2000 tons; turbo-electric drive, single screw, developing 3220 shaft horsepower.

McCormick Vessels to be Reconditioned.

The McCormick Steamship Company, San Francisco, recently purchased the steamers West Ivis and West Ira from the Shipping Board for operation in the Pacific-Argentine Brazil Line. These vessels are at New Orleans and will be brought to the Pacific Coast to have passenger accommodations and refrigerator space installed before going into service.

May Build Two Tugs

We have heard rumors to the effect that the Southern Pacific Company, San Francisco, is considering the building of two tugboats.

Recent Shipbuilding Contracts

Newport News Shipbuilding and Drydock Co., Newport News, Virginia, has been awarded contract by the Atlantic, Gulf & West Indies Steamship Co. of New York for the construction of two turbo-electric passenger and freight vessels for the Ward Line service from New York to Havana.

The vessels will be 508 feet overall, 69 feet 8 inches molded beam, 26 feet loaded draft, 15,380 tons displacement; 4155 tons cargo capacity; 24,000 cubic feet of cold storage, and 84,000 cubic feet cooled air cargo space. The vessels will have accommodations for 378 first cabin and 90 tourist class passengers. They will have twin screws driven by electric motors; steam for the turbines being supplied by Babcock & Wilcox boilers; Sperry gyo-compass; and all other equipment of the most up-to-date type. The Newport News shipyard bid $4,350,000 each for the construction of these two boats.

Defoe Boat & Motor Works, Bay City, Michigan, has an order for a steel yacht, the Olive K., for C. F. Kettering of Detroit, to be 169 feet between perpendiculars, 26 feet beam, 12 feet loaded draft; 15 knots speed, driven by 1000 horsepower diesel engines; keel to be laid January 15.

This yard has an order for a wood yacht for Albert A. Rose of Detroit, to be 75 feet 6 inches between perpendiculars, 14 feet 6 inches beam, 4 feet draft, powered with 500 horsepower gas engines to develop a speed of 18 miles.

Dravo Contracting Co., Pittsburgh, Penn., is building six 130-foot stock barges and 10 stock barges 100 feet length.

Manitowoc Shipbuilding Corp., Manitowoc, Wis., has an order from the Pere Marquette Railroad Co. for two car ferries, 368 feet between perpendiculars, 57 feet beam, 17 feet loaded draft; 18 miles speed; to be powered by two steam turbines developing 3600 horsepower each; 4 Babcock & Wilcox boilers.

Nashville Bridge Co., Nashville, Tenn., is building three 180-foot barges and one 110-foot barge.

Prince Rupert Drydock & Shipyard, Prince Rupert, B.C., has an order from Dan Larsen for a halibut fishing boat, the Capello I., to be 52 feet between perpendiculars, 13 feet beam, 5 feet 6 inches draft; powered with 50-B.H.P. Bolinder semi-diesel engine.

George Lawley & Son Corporation, Neponset, Mass., has an order from Walter P. Murphy, 300 Park Avenue, New York, for a steel schooner of 550 gross tons.

Nunes Brothers, Sausalito, Calif., has recently received an order from M. F. Correig for a 110-gro. ton diesel powered fishing boat; and from M. M. Medina for a 100 gross ton fishing boat.

Anderson & Cristofani, Hunter's Point, San Francisco, are building fifteen 28-foot sailboats of the Columbia River salmon boat type for the Union Fish Company of San Francisco for Alaska salmon fishing. This yard also has an order for salmon fishing boats from the Red Salmon Canning Co.

Lake Union Shipbuilding & Drydock Co., Seattle, has an order from the American Can Company, through L. E. Geary, Seattle naval architect, for a 77-foot service boat to transport supplies to the canneries in Southeastern Alaska. 350-horsepower gas engines will propel the boat at 13 knots.

Collingwood Shipyards, Ltd., Collingwood, Ontario, is building two triple expansion, twin screw engines of 6500 indicated horsepower, steam to be supplied by six Scotch marine boilers 15 ft. 6 in. diameter.

Midland Shipbuilding Co., Midland, Ontario, has contract for the conversion of the steamer Midland Prince into a self-unloader.

Lake Washington Shipyards, Houghton, Washington, have received a contract from Libby, McNeill & Libby of Seattle for a 65-foot diesel tug, six scows, and a 30-foot gill netter. The tug is to be engined by a 100-horsepower Washington-Estep diesel. The scows are to be 72, 66, 60 feet long, two 56, and a pile driver scow.

This yard also has an order from the U. S. Coast and Geodetic Survey for 10 16-foot dories.

Wallace Bridge and Structural Steel Company, Seattle, has an order from Young Bros., Ltd., of Honolulu for an Ellis channel system all-steel construction barge.

Bath Iron Works, Bath, Maine, has been awarded contract by Henry J. Gielow, Inc., of 25 West 43rd Street, New York, for a large steel yacht for J. P. Morgan. The yacht will be about 350 feet long and will be one of the most palatial vessels turned out of an American shipyard.

Crowley Launch & Tugboat Company of San Francisco has started construction in its Oakland yard of four new type creosoted barges.

New London Ship & Engine Company, New London, Conn., has been awarded the contract for the construction of two double-end diesel-electric ferryboats for the Ward Island service of the New York State Department of Mental Hygiene, Albany, N.Y.

Each vessel will be 115 feet long, 38 feet beam, and powered by two 250-brake horsepower Nelseco diesel engines, connected to electrical generators. The vessels were designed by Eads Johnson of New York and are to accommodate 300 passengers and carry automobiles and trucks.

Howard Shipyards & Dock Co., has an order for a steam towboat from the Wheeling Steel Corp. This yard also has an order from the U.S. Bureau of Lighthouses for a tender.

Staten Island Shipbuilding Co., has an order for a dredge hull for the Atlantic, Gulf & Pacific Co.

News from the Shipyards

REPAIR AWARDS

The Moore Dry Dock Company has been awarded contract for reconditioning the former Shipping Board steamer West Harts, recently purchased by the States Steamship Company of Portland. The United Engineering Co., San Francisco, was low bidder for this work, but the vessel was already at the Moore yard, and contract went to the Moore yard thereby eliminating the towage charge. Bids were:

Moore Dry Dock Company, $39,491; Bethlehem Shipbuilding Corp., $39,908; General Engineering & Drydock Co., $44,708; United Engineering Co., $39,274.

The vessel will be named Texas and will be equipped with an ice machine furnished by the Harris Ice Machine Co. of Portland.

General Engineering & Drydock Company of San Francisco has been awarded contract by Pillsbury & Curtis of San Francisco for reconditioning the former Shipping Board steamer Mursa. The vessel was purchased by Pillsbury & Curtis for the Los Angeles Steamship Company, and it is announced that the vessel will be used in a service to be made known when the vessel is ready.

The work of reconditioning the freighter will comprise removal of the turbines now installed and replacing them with reciprocating engines. The lower half of the stern frame is to be renewed, and new generators are to be installed, in addition to a general overhaul of the entire ship.

The Mursa is of 4386 tons net, 402.6 feet long, 53 feet beam, 32.2 feet depth. She was built in 1920 at the Oakland yard of The Moore Dry Dock Co.

REPAIRS.

The Moore Dry Dock Company, Oakland, Calif., has been awarded contract by the Oceanic and Oriental Navigation Company for installation of refrigerator space in four cargo steamers, first to be the Golden Cross.

The passenger and freight steamer Princess Adelaide, owned by the Canadian Pacific, was badly damaged recently when she was rammed by the Norwegian freighter Hampholm in English Bay. It is unofficially reported that repairs to the Princess Adelaide will cost around $50,000 and repairs to the Hampholm around $15,000.

KEEL LAYINGS

Hualalai, passenger and freight steamer for Inter-Island Steam Nav. Co., Honolulu, by Bethlehem Shipbuilding Corp., San Francisco, on Dec. 17.

Double-end diesel-electric ferryboat for San Diego-Coronado Ferry Co. by The Moore Dry Dock Co., Dec. 27.

Dredge by Nashville Bridge Co., Nov. 15; six barges during December.

Fireboat for City of Tacoma by Coast Line Shipbuilding Co., Tacoma, Dec. 17.

LAUNCHINGS

Delta Standard, steel tank barge for Standard Oil Co. (Calif.) by Bethlehem Shipbuilding Corp., San Francisco, Jan. 8; barge for Martin Ship Service; Jan. 8.

Steel cargo barge for Canadian National Railways by Prince Rupert Drydock & Shipyard, Dec. 27.

Diesel-electric dipper dredge for Great Lakes Dredge & Dock Co. by Manitowoc Shipbuilding Corp., Dec. 18.

Viking, steel yacht for Geo. F. Baker, Jr. by Newport News Shipbuilding & Drydock Corp., Dec. 15.

Captain George, single screw tugboat for U. S. Engineers, by Chas. Ward Engineering Works, Dec. 28.

Mikimiki, towboat for Young Bros., Honolulu, by Lake Washington Shipyards, Seattle, Jan. 15.

DELIVERIES

Delta Standard, steel tank barge to Standard Oil Co. (Calif.) by Bethlehem Shipbuilding Corp., San Francisco, Jan. 8.

Steel clam shell dredger to San Francisco Harbor Board by The Moore Dry Dock Co., Dec. 5.

Wood tug to John Currie & Son by Prince Rupert Drydock & Shipyard, Dec. 31.

Eighteen Mississippi River Commission Barges by American Bridge Co. during Dec.; two barges to Anderson Tully Co., Jan.

Georgetown, single screw steel diesel trawler to Atlantic & Pacific Fish Co., Boston, by Bath Iron Works, Dec. 18.

Barbett, wood yacht for C. A. Caryell by Defoe Boat & Motor Works, Nov. 15.

One steel carfloat to New York Central Railroad Co. by Dravo Contracting Co. during Dec.; fourteen standard Mississippi River Comm. barges during Dec.

Oil barge to Oil Transfer Corp. by Federal Shipbuilding & Drydock Co., Dec. 27.

Two barges for Mississippi River Comm., New Orleans, by Howard Shipyards & Dock Co., Dec. 16; Porterfield, towboat to U. S. Engineers, Dec. 20.

Sternwheel oil barge for Tropical Oil Co. by Marietta Manufacturing Co., Nov. 15.

Ferryboat for Davidson County, Tenn., by Nashville Bridge Co., Dec. 15.

Steam lighter to Pennsylvania Railroad Co. by New York Shipbuilding Co., Dec. 20.

Major, stern-wheel towboat by Charles Ward Engineering Works, Dec. 10.

Bids Opened for Shipping Board Lines

The United States Shipping Board at Washington, D.C. opened bids on January 14 for the sale of the United States Lines and the American Merchant Line.

The highest bid was that of P. W. Chapman, Inc., of New York: $16,082,000 for all the vessels of the United States Lines and American Merchant Lines. Provision also was made to perform needed construction to equip the United States Lines with modern vessels.

Ship-to-shore airplane service together with transatlantic dirigibles was one of the proposals of J. H. Winchester & Company, Inc., of New York, and Gibbs Brothers, Inc., which submitted a joint bid. Offering to buy the present ships of the two lines, minus the President Harding and President Roosevelt, for $10,000,000, these bidders stated they also would build new first-class ships and cabin-type ships, and presented plans for supplementing the ocean liners with ship-to-shore airplane service and dirigible service.

The J. H. Winchester Company, at present operating the American Merchant Lines, offered an alternative proposal to buy the five vessels of this line for $605,000 each, or a total of $3,025,000, for operation over their present route between New York and London.

The American Line Steamship Corporation offered $6,000,000 for steamships Leviathan, George Washington, America, Republic, President Harding and President

Roosevelt. The same company offered $300,000 each for the ships of the American Merchant Line, on five years' guaranteed service.

The Export Steamship Corporation of New York, bid $812,000 each for the President Harding and President Roosevelt.

The Dollar Steamship Company offered $505,000 each for the vessels of the American Merchant Lines, or a total of $2,525,000, under the proposal to establish an American flag steamship service between the Pacific Coast and European ports.

The Roosevelt Steamship Company of New York offered $455,000 each for the vessels of the American Merchant Line to be continued over its present route, or a total of $2,275,000.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of January 1, 1929.

Pacific Coast

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length over-all; 30' beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28 est.

Hull No. 113, lightship, sister to above; keel Sept. 1/28 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BALLARD MARINE RAILWAY COMPANY,
Seattle, Washington

Mikimiki, hull J 91, tugboat for Young Brothers, Ltd., Honolulu; 115 L.B.P.; 28 beam; 12 draft; 11 knots speed; 1040 Fairbanks-Morse diesel engs.; keel Sept. 12/28; **launched Jan. 15/29.**

BETHLEHEM SHIPBUILDING CORPORATION, LTD,. UNION PLANT
Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Hualalai, hull 5336, passenger and freight steamer for Inter-Island Steam Navigation Co., Honolulu; 295 L.B.P.; 27'6" beam; 17'6" loaded draft; 15 knots speed; 1200 D.W.T.; steam turbines; 4000 S.H.P.; 4 W.T. boilers; **keel Dec. 17/28.**

Delta Standard, hull 5337, steel tank barge for Standard Oil Co. (Calif.), San Francisco; 100 L.B.P.; 23'5" beam; 5'0" loaded draft; 2 gas engines; 100-125 B.H.P. each; keel Oct. 30/28; **launched and delivered Jan. 8/29.**

Humuula, hull 5338, steel passenger and freight steamer for Inter-Island Steam Navigation Company, Honolulu, 1100 Gr. tons; keel Feb. 14/29 est.

Hull 5340, barges for Inter-Island Steam Nav. Co., Honolulu.

Hull 5341, barge for Martin Ship Service, San Francisco; **launched Jan. 8/29.**

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A. Wanner.

Hull 19, tow barge for Standard Oil Co. (Calif.), San Francisco; 72 L.B.P.; 24' beam; 4' loaded draft; 100 D.W.T.

Not named, hull 20, fishing boat for A. Paladini, Inc., San Francisco; 65' L.O.A.; 16 beam; 6 loaded draft; 125 H.P. 5-cyl. Union diesel eng.; keel Oct. 19/28.

J. C. JOHNSON'S SHIPYARD
Port Blakley, Wash.

Scow same as above, launched Aug. 13/28.

One scow for Salmon Bay Sand & Gravel Co., Seattle; 100x36x10 ft.

THE MOORE DRY DOCK CO.
Oakland, California.

Purchasing Agent: N. Levy.

One steel carfloat for Atchison, Topeka & Santa Fe Railway, San Francisco; 260 L.O.A.; 38' beam over all; 12'6" depth midships; capacity 14 80-ton cars; launch Oct. 10/28 est ; deliver Jan. 5/29 est.

One steel clam shell dredger for Board of State Harbor Commissioners, San Francisco; 90x41x12'9"; **delivered Dec. 5/28.**

Not named, one steel, screw double-ended diesel-electric automobile ferryboat for San Diego and Coronado Ferry Co.; 190 L.O.A.; 43'6" breadth of hull at deck; 60' breadth over guards; 14'9" depth at sides, molded; 8'11" light draft, molded; **keel Dec. 27/28**; deliver Apr. 20/29 est.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

One steel car barge for Canadian National Railways, Vancouver, B.C.; 270 x 42 x 12' depth; keel Sept. 12/28; **launched Dec. 27/28**; deliver Jan. 10/29 est.

Wooden tug for John Currie & Son; 40 x 12 x 6 ft.; keel Oct. 1/28; **delivered Dec. 31/28.**

Copello I, hull 27, halibut fishing boat for Dan Larsen; 52 L.B.P.; 13 beam; 5'6" loaded draft; 50 B.H.P. Bolinder semi-diesel engs ; keel Jan. 9/29 est.; launch Mar. /29 est.; deliver Apr. /29 est.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4 '28; deliver Mar. 13/31 est.

Atlantic. Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Thirty Mississippi River Commission barges for: 120x30x7'; **24 delivered.**

One acid barge for American Steel Wire Co.; 100x26x7 ft.

Two barges for Anderson Tully Co., Memphis; 160 x 34 x 7 ft.; **delivered January/29.**

Twelve barges for Crucible Fuel Co., Pittsburgh; 175 x 26 x 11 ft.

BATH IRON WORKS
Bath, Maine

Georgetown, hull 121; single screw steel diesel trawler for Atlantic & Pacific Fish Co., Boston; 123'x23'x14'; 400 B.H.P. Fairbanks-Morse diesel engine. Bath Iron Works design. Keel June 14/28; **launched Dec. 15/28; delivered Dec. 18/28.**

Paragon, hull 122, twin screw steel diesel yacht: 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer; keel Dec. 3 28, launch Apr. 10/29 est.; deliver May 1, 29 est

Hi-Es-Maro, hull 123, twin screw steel diesel yacht, Henry J. Gielow, Inc., New York, designer; 266'x35'x22' depth; 14'6" draft; two 1200 B H P. Bessemer diesel engs.; keel Nov. 14/28

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Chelon, diesel-elec. cutter for U.S. Coast Guard Service; 250x42x15 ft.; Westinghouse turbines and motors; 3000 S H P.; launched May 19/28, **delivered.**

Tahoe No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Shamut, hull 1419, steel trawler for Mass. Trawling Co.; 116 ft. long; 460 gro. tons; **delivered Nov. /28.**

Trimount, hull 1420, sister to above; **delivered Nov. /28.**

Hull 1421, boat for R O'Brien & Co.; 230 gr. tons; **delivered Nov. /28.**

Not named, Hull 1422, single-screw coal collier for Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Not named, hull H-1424, steel passenger and freight steamer for New England Steamship Co., 1800 gro. tons.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; Winton engs.; General Electric generators and motors; keel Jan. 20/29 est.

No. 116, same as above; Jan. /29 est.

No. 117, same as above; keel May 1/29 est

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2921, 106-ft. cruiser for L. M. Wainwright, Indianapolis; 2 Speedway diesels, 300 H.P. ea. at 700 r.p.m., wt. 7500 lbs.; deliver May/29 est.

Hull 2923, 66-ft. cruiser for J. McMillan, Detroit, Mich.; 2 170-H P. Speedway engs.; deliver May /29 est.

Not named, hull 2925, 64-ft. cruiser for Rear Admiral L. M. Josepthals, New York; 2 170-H.P. Speedway engs.; deliver May/29 est.

Not named, hull 2926, 76-ft. cruiser for Adolph M. Dick, New York; 2 300-H.P. Speedway engs.; deliver June /29 est.

Not named, hull 2927, 35-ft. fishing boat for Leon Goodman, Philadelphia; two 44-H.P. Speedway engs.; deliver June 1/29 est.

Hull 2928, 21-ft. coupe yacht tender for Arthur Wheeler, New York; 1-22-H.P. Speedway, deliver May 1/29 est.

Hull 1929, 16-ft. yacht tender for above; 1 Universal eng.

Not named, hull 2930, 106-ft. cruiser for W. C. Robinson, Pittsburgh; 2 Speedway diesel engs.; deliver May 15/29 est.

Hull 2931, 16-ft. yacht tender for above; 1 Universal eng.

Not named, hull 2932, 50-ft. fishing boat for Caleb S. Bragg, New York; 2 170-H.P. Speedway engs.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Barbett, hull 130, wood yacht for C. A. Caryell, Bay City; 90 L.B.P.; 17 beam; 4 loaded draft; 12 mi. loaded speed; 75 D.W.T.; 200 I.H.P. diesel eng.; keel June 20/28; launched Nov. 1/28; **delivered Nov. 15/28.**

Yoreda, hull 131, steel yacht, for Aaron De Roy, Detroit; 105 L.B.P.; 17 beam; 6 loaded draft; 14 mi. loaded speed; 110 D.W.T.; 250 H.P. diesel eng.; keel Aug. 1/28; launch May 1/29 est.; deliver June 1/29 est.

Bonny II., hull 132, wood yacht for C. W. Bonbright, Flint, Mich.; 61 L.B.P.; 13 beam; 4 loaded draft; 18 m.p.h.; 300 I.H.P. gas eng.; keel Oct. 15/28; launch Apr. 15/29 est.; deliver May 1/29 est.

Olive K., hull 133, steel yacht for C. F. Kettering, Detroit; 169 L.B.P.; 26 beam; 12 loaded draft; 15 knots speed; 600 D.W.T.; 1000 I.H.P. diesel engs.; keel Jan. 15/29 est.; launch July 1/29 est.; deliver Aug. 15/29 est.

Not named, hull 134, wood yacht for Albert A. Rose, Detroit; 75'6" I.H.P.; 14'6" beam; 14' loaded draft; 18 M.P.H.; 70 D.W.T.; 500 H.P. gas eng.; keel Jan. 5/29 est.; launch and deliver May 1/29 est.

DRAVO CONTRACTING COMPANY,
Pittsburgh, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'6" x 26'6" x 5' 6".

Hulls 691-694 inc. four steel carfloats for New York Central Railroad Co.; 270x38 x10'5"; 850 gro. tons ea.; **two delivered.**

Hulls 722-23, 2 standard steel barges for stock; 130'x30'x7'6"; 250 gr. tons ea.; **one delivered.**

Hulls 753-784 inc., 32 standard Mississippi River Comm. barges for Memphis office; **23 delivered.**

Hulls 787, 788, two steel house barges for Merchants and Miners Transp. Co.; 120 x 30 x 7 ft.

Hulls 789, 790, 791, three standard barges for Ohio River Sand Co., Louisville, Ky.; 130 x 30 x 7'6".

Hulls 794-799 inc.; 6 standard barges for stock; 130x30x7'6".

Hulls 800 to 809 inc.; 10 standard barges for stock; 100 x 26 x 6'6".

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 104, oil barge for Oil Transfer Corp., 175x35x12'5"; keel Oct. 16/28; **launched Dec. 13/28; delivered Dec. 27/28.**

Hull 105, oil barge for above; **146x34'8"** x10'2¼" (welded barges).

Hull 106, lighter hull for J. W. Sullivan Co.; 121x32'6"x13'4½"; **keel Nov. 15/28.**

Hull 107, welded steel barge for Boston Molasses Co.; 60x20'4¾"x7'6".

Hull 108, same as above.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hulls 1656-7, two barges for Mississipi River Comm., New Orleans, 120x30x7'6"; keels Oct. 15 and 29/28; launched Dec. 3/28; **delivered Dec. 16/28.**

Porterfield, hull 1658, towboat for U.S. Engineers Dept., Vicksburg, Miss.: 64'10"x 18'x3'10"; 100 H.P. diesel eng.; keel Oct. 16/28; launched Nov. 22/28; **delivered Dec. 20/28.**

Hull 1659, steam towboat for Wheeling Steel Corp.

Hull 1660, lighthouse tender for U.S. Bureau of Lighthouses.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 244, diesel-electric dipper dredge for Great Lakes Dredge & Dock Co., 156 L.B.P.; 43 beam; 10 ft. draft aft; keel Aug. 30/28; **launched Dec. 18/28;** deliver June 1/29 est.

Not named, hull 246, car ferry for Pere Marquette Railroad Co.; 368 L.B.P.; 57 beam; 17 loaded draft; 18 m. speed; 2 turbines; 3600 I.H.P. each; 4 Babcock & Wilcox W.T. boilers; launch July /29 est.

Not named, hull 247, carferry, sister to above.

MARIETTA MANUFACTURING COMPANY
Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Hull 234, sternwheel oil barge for Tropical Oil Co.; 203'x44'x5'6"; Marietta tamden comp. eng. 14"x28"x84"; keel July 18/28; **delivered Nov. 15/28.**

Hull 235, sister to above; keel Aug. 1/28; deliver Jan. 11/28 est.

MIDLAND BARGE COMPANY
Midland, Pa.

One dredge hull for M. H. Treadwell Co. of New York; 150'x70'x13'6".

Three fuel barges for Union Barge Line Corp., Pittsburgh; 100x24x8 ft.

Four line barges for U.S.A. Engineers, Vicksburgh.

Four barges for Pittsburgh Plate Glass Co., Pittsburgh; 135x26x10 ft.

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Not named, hull 23, single screw package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42'9" beam; 14' loaded draft; 12 mi. speed; 2200 D.W.T.; TE steam engs.; 1300 I.H.P.; 2 Scotch boilers, 14'6" dia. x 11' long; keel Dec. 4/28; launch Apr. 1/29 est.; deliver May 1/29 est.

Midland Prince, converted to self-unloader.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Hull 149, towboat for Standard Unit Nav. Co.; 92x24x5 ft.; keel May 10/28; launch Feb. 1/29 est.

Hull 161, ferry hull for stock; 150 L B.P.; 62 beam; 8 loaded draft; keel Sept. 16/28; launch Feb. 10/29 est.

Not named, hull 163, ferryboat for Davidson County, Tenn.; 60 L.B.P.; 16 beam; 3 loaded draft: keel Oct. 15/28; **launched and delivered Dec. 15/28.**

Hull 165, deck barge for stock; 120x 30x7 ft.; keel Oct. 10/28; **launched Dec. 26/28.**

Hull 166, dredge for stock; 80 L.B.P.; 36 beam; 6 loaded draft; **keel Nov. 15/28.**

Hull 167, deck barge for stock; 110 x 28 x 7'3"; **keel Dec. 15/28.**

Hull 168, deck barge for stock; 110 x 28 x 7'3"; **keel Dec. 15/28.**

W. W. Fischer, hull 169, diesel towboat for Central Sand Co.; 120x26x5½ ft.; 720 I.H.P.; keel Feb. 1/29 est.

Hull 170, deck barge, 110x28x7¼ ft.; **keel Dec. 7/28.**

Hull 171, deck barge, 100x24x5 ft.; **keel Dec. 12/28.**

Hull 172, same as above.

Hull 173, deck barge, 100x26x6½ ft.; **keel Dec. 18/28.**

Hull 174, same as above; keel Jan. 10/29 est.

Hull 175, ferryboat, 60x18x2¼ ft.

Hull 176, barge, 100x26x6½ ft.; **keel Dec. 20/28.**

Hull 177, tug, 50x12 ft.; 150 H.P.

Hull 178, dredge, 100x36x8 ft.

Hulls 179-183 inc., 5 barges, 120x30x 7 ft.

Hull 184, deck barge; 180 x 40 x 9½ ft.
Hull 185, deck barge; 180 x 40 x 9½ ft.
Hull 186, deck barge; 180 x 40 x 9½ ft.
Hull 187, deck barge, 110 x 32 x 7¼ ft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement, keel July 2/28; deliver Mar. 13/31 est.

Viking, hull 328, steel yacht for Geo F. Baker, Jr., 272'1" L.O.A.; 36'6¾" beam; 18'6" depth; two turbine driven G.E. motors; 2 Babcock & Wilcox WT boilers; 1200 gross tons; 2600 S.H.P.; keel July 3/28; **launched Dec. 15/28;** deliver Apr./29 est.

Pennsylvania, hull 329, 18 - knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Oct. 15/28.

President Johnson, ex-Manchuria, hull 330, reconditioning for Dollar Steamship Co., San Francisco.

City of Elwood, hull 331, diesel conversion for U.S. Shipping Board.

Ward, hull 332, diesel conversion for U.S. Shipping Board.

NEW YORK SHIPBUILDING CO.
Camden, N. J.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; launch Jan. 23/29 est.; deliver July 9/29 est.

Chester, light cruiser CL- 27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.

Hull 378, steam lighter for Pennsylvania Railroad Co.; keel Sept. 1/28; launched Nov. 28/28; **delivered Dec. 20/28.**

Santa Clara, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'8" beam; 37' 5" depth; General Electric turbo-electric machinery; keel Feb. 15/29 est.

THE PUSEY & JONES CORP.,
Wilmington, Del.

Purchasing Agent: James Bradford.

Acania, hull 1038, twin screw diesel yacht for Arthur E. Wheeler, New York; 126 L.O.A.; 21'6" beam; 8'6" app. loaded draft; 2 250-B H P. diesel engs.; keel Oct. 18/28; launch Feb. 1/29 est.; deliver April 15/29 est.

Not named, hull 1039, oil tanker for Tide Water Oil Co.; 225 L.B.P.; 44 beam; 15'6" loaded draft; 10½ knots speed; 2300 D.W.T.; diesel-electric power; 1000 L.H.P.

Not named, hull 1040, yacht for Fred J. Fisher, Detroit; 236 L.O.A.; 34 beam; 19 depth; 2 1100 H.P. diesel engs.

Not named, hull 1041, yacht for Alfred P. Sloan, Jr., New York; same as above.

Not named, hull 1042, yacht for owner not named; same as above.

THE SPEAR ENGINEERS, INC.,
Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

John M. Dennis, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450-I.H.P. engs.; keel Feb. 18/28; launched Dec. 15/28; deliver Mar. 15/29 est.

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor, keel Aug. 18/28.

Not named, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P., keel Jan. 15/29 est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Charles E. Evans, hull 264, fire and patrol boat for Commissioners, Washington, D.C.; 55' L.O.A.; 11'9" molded beam; 6'9" molded depth; 5' loaded draft; 31 D.W.T.; 100 H.P. Standard diesel eng.; keel Aug. 25/28, launched Nov. 22/28; deliver Feb. 1/29 est.

Not named, hull 265, steel hull, steam driven, patrol vessel for Supervisors of New York Harbor, 39 Whitehall Street, New York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam; 10'1½" mean draft; T. E. engs.; Babcock & Wilcox W.T. boilers.

STATEN ISLAND SHIPBUILDING CO.,
Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Dongan Hills, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel July 2/28.

Hull 782, barge for Grasselli Chemical Co.; 150 x 38 x 12'6".

Pittsburg, hull 684, dredge hull for Atlantic, Gulf & Pacific Co.; 162 L.B.P.; 44 beam; 15 loaded draft.

SUN SHIPBUILDING COMPANY,
Chester, Penn.

Purchasing Agent: H. W. Scott.

Not named, hull 116, passenger and freight motorship for American South African Line, Inc., New York; 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs.; keel Mar. 14/29 est.

Not named, hull 117, tanker for Sun Oil Co.; 245 L.B.P.; 43 beam; 15'6" loaded draft, 8 knots speed; 2300 Bessemer diesel engs.

TODD DRYDOCK, ENGINEERING & REPAIR CORP.,
Brooklyn, N.Y.

Purchasing Agent H. J. Shannan.

Not named, hull 45, steel double-end ferryboat for City of New York, Dept. of Plant and Structure; 151 L.O.A.; 53 beam over guards; 37'6" molded beam; depth to top of beams 14'3"; draft 8'3"; steam engs.; keel Nov. 1/28.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Dwight W. Davis, hull 69, steam propelled towing boat for Inland Waterways Corp., Washington, D.C.; 140x25x9 ft.; 2 500-H.P. Nordberg engs.; equipped to burn powdered coal, keel July 23/28.

Captain George, hull 73, single screw tugboat for U. S. Engineer Office, Galveston; 65'6"x17'x7'7½"; 190 B.H.P. Winton diesel eng.; keel Oct. 16/28; **launched Dec. 28/28;** deliver Jan. 5/29 est.

Tom Stallings, 74, Western river type, steam driven 30-ton snag boat for Memphis River and Harbor District, U.S. Army engineers; 127"x30'x4'4"; keel Nov. 27/28.

Major, hull 75, stern-wheel towboat for stock; 64'9"x18'x4'5"; diesel eng.; keel Oct. 12/28; launched Nov. 21/28; **delivered Dec. 10/28.**

Not named, hull 76, sister to above.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD., Union Plant.

Drydock, paint, misc. repairs: F. H. Hillman, H. T. Harper, President Van Buren, Wilhelmina, Washington, Frank G. Drum, D. G. Scofield, Tulsagas, Malolo, Virginia, Daisy Gray, Raymond Barge No. 2, Hartwood (no repairs), Raymond derrick barge, Frank D. Stout (not painted). Pipe repairs: La Purisima. Propeller repairs: dredge San Pablo, stmr. Wm. H. Doheny, Frank D. Stout. Furnish and install shearlegs. tug Star. Repairs to steering gear: Curacoa. Drydock for survey: Ionicstar. Repair damaged shell plate: Frank H. Buck. Misc. repairs: Oleum, Chiapas, Standard Oil Barge No. 7, Calmar, Larry Doheny, City of Los Angeles, Omphale, U.S.S. Medusa, Pat Doheny, Homer, barge Wade Brown, m.s. Brunswick, stms. Munami, William H. Doheny, Utacarbon, m.s. Stanford, Oilpioneer, dredge John McMullen, stmrs. Munaires, Papoose, barge Lahaina, m.s. West Lynn, Beulah, stmrs. California, San Mateo, Tascalusa, F. A. Douty, Esparta, Point Arena, Pacific, W. S. Rheem, La Perla, Tahiti, San Jose, Corsicana, Point Bonita, Sugillenco, Quercus, Limon, H. W. Baxter, Prentiss, J. B. Stetson, Whitney Olson, James Griffiths, Quinault, Santa Inez, French cruiser Edgar Quinet, barge Erskine W. Phelps.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

Annual repairs and installation of refrigerating machinery: stmrs. Tulsa, Shickshinny. General repairs: stmrs. Wildwood, Sprigg Carroll, m.s. Palmetto.

PRINCE RUPERT DRYDOCK AND SHIPYARD,
Prince Rupert, B.C.

Docked, cleaned, painted, misc. hull and engine repairs: 4 fishing boats. Misc. hull and engineer repairs, not requiring docking: 26 fishing boats. 58 commercial jobs.

TODD DRY DOCKS, Inc.,
Seattle, Washington.

Bottom repairs: Alaska. Drydock for misc. repairs. Mauna Ala. General overhauling: West Hartland. Hull damage repairs: Albionstar. Voyage repairs: President Cleveland, President Grant, President McKinley. Misc. repairs: Magicstar, Point Sur, Tairyo Maru, Vikingstar.

U.S. NAVY YARD,
Bremerton, Wash.

Dock and misc. repairs: Colorado, Cuyama, Decatur, Zeilin, Moody, J. F. Burnes. Misc. repairs incidental to operation as district craft: Mahopac, Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.

Who did What -- and How

Chief Engineer Ernest Prince was congratulated by officials of the Panama-Pacific Line when the crack electrically driven liner California reached San Diego on her last voyage from New York to California ports.

The California established a record run from Balboa to San Diego of 6 days and 11 hours.

Chief Engineer Prince remained in San Francisco when the California sailed for the return voyage. He is taking charge of the propulsion department of the liner Virginia and his berth on the California was taken by Chief Engineer Edwin W. Bence.

Chief Engineer Prince relieved Chief Engineer John Carstairs, who is now at the Newport News Shipyards observing and supervising the installation of the entire machinery that will operate the third intercoastal vessel, Pennsylvania, of the Panama-Pacific liner.

* * *

Ports of the Pacific Coast are second to none in the world for the rapid fueling of ships. Among the finest oil docks in the world are established on the Pacific Coast, and among the finest are the maritime fuel stations of the Shell Oil Company.

There is never a day in the year that a vessel is not fuel with Shell marine oils at one of their modern oil docks.

Capt. Henry Stephenson of the Panama Mail Liner El Salvador.

Although Chief Engineer George Whitehead has been sailing the seas for a quarter of a century and has visited virtually every country in the world, he had never visited California until his arrival here aboard the Panama Mail Steamship Company's liner El Salvador on her maiden trip under the Panama Mail flag.

The genial chief remarked that being an engineer aboard an oil burning vessel was quite a change for the better from the days when he served aboard coal burners.

"Quick loading and no coal dust to bother about," stated Chief Engineer Whitehead, as he watched the El Salvador taking fuel from an oil barge.

* * *

The big coastwise liner Ruth Alexander on her maiden voyage in the Dollar around-the-world service, relieving the President Adams, which went aground outside the breakwater at Cristobal, was painted in the regulation green hull of the Dollar Line before she sailed.

The Ruth Alexander took on a full consignment of Shell marine oils at San Francisco before she departed. She carried a full list of passengers and freight.

Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

Although Chief Engineer George **Whitehead** of the Panama Mail liner El Salvador has sailed the seas for thirty-five years and has visited more than forty world ports, he had never made San Francisco a port of call until the liner El Salvador was taken over by the Panama Mail Line for its New York, Central America, California passenger and freight service from W. R. Grace & Co.

Chief Engineer Whitehead has sailed on every vessel of the Grace fleet, with the exception of the two new motorships. Despite the fact that it was the genial chief's first visit to San Francisco, he was greeted by a number of engineers upon his arrival and was tendered several dinners.

San Francisco friends received advices of the appointment of **F. B. Wreaks** as superintendent of the western marine department headquarters of the Aetna Marine Insurance Company in Chicago.

Mr. Wreaks is widely-known on the Pacific Coast, having been identified with the San Francisco offices in the marine department of Wilcox, Peck & Hughes, from 1921 to 1924.

A. J. McCarthy, operating manager of the Panama Pacific Line.

Increase of the service of the **Reardon Smith Line** is announced by officials. Soon its fleet of carriers between the Pacific Coast and the United Kingdom will be enhanced with the addition of six vessels of the type of the West Lynn and East Lynn. Contracts for the vessels have already been awarded to William Gray & Company, West Hartlepool. The vessels will be coal-burners and will be constructed at a total cost of $2,500,000, it is reported.

Indications that the International Mercantile Marine Company, which owns the **Panama Pacific Line**, may start a direct passenger and freight service from West Coast ports to Europe are contained in recent advices from New York. American bottoms would be used in the service, the rumors declare. **P. A. S. Franklin**, president of the I.M.M. indicates in recent press interviews that his company is planning expansions for foreign trade.

Sale of the two northern salmon canning plants of the Alaska-Portland Packers' Association, with their floating equipment, as well as the steamer North King, now in winter quarters at Goble, has been made to the Pacific American Company, owner of Pacific-American Fisheries, with headquarters at South Bellingham, Washington. Consummation of the transaction was confirmed by **Frank M. Warrane**, president of the Alaska-Portland Packers' Association.

Captain John Patricio, veteran San Francisco Bay mariner and retired Coast Guard skipper, was recently honored by more than a score of his marine world associ-

Deck officers of the Virginia. Left to right: Captain H. A. T. Candy, Chief Officer Robert J. Sullivan, First Officer John Mockrish, Second Officer Carl Hegenberger, Junior Third Officer John A. Fagan, Fourth Officer Joseph H. Dugvale. Photo taken on bridge of Virginia at San Francisco.

ates of San Francisco and the bay cities. Bar pilots of San Francisco bay and customs officials were all present at the affair which was staged at the Elks Club. **Captain Al Thomson,** bar pilot, presented him with a beautiful ship's clock. Captain Patricio recently retired after thirty years service in various ships of the United States Coast Guard.

Reports received by **Roy V. Crowder,** passenger traffic manager of the Los Angeles Steamship Company, indicate that all travel records to Hawaii through the port of Los Angeles will be broken this season. The reports state that thousands of inquiries have been received by agents of the Lassco Line relative to bookings on the liners of the Los Angeles Steamship Company on the run to Hawaii.

A half century of sea service. That is the record of **Captain O. B. Lindholm,** master of the Grace line freighter Cacique. Starting as a deck hand on a small schooner trading out of Finland in 1878, Captain Lindholm has had an enviable and long record at sea. In '98 he brought the brig Courtney Ford into Vancouver harbor and tied her up without assistance from a tug, a feat never before accomplished. Captain Lindholm has been in the Grace Line service for fourteen years. The Cacique is on the run between San Francisco, Peru, and Chile.

Death came to **Captain H. E. Halvorsen** while preparing to leave his home port for Seattle to take command of the Ruth Alexander. The shipmaster, resident of Berkeley, was widely known on the Pacific Coast. Death followed an attack of influenza.

Capt. Wesley Austin, lighthouse keeper at Ocracoke, North Carolina, for fifteen years, is retired. The veteran keeper will make his residence near the light which proved such a benison to the seafarers.

Inauguration of the regular triangular service of the Matson Line between Portland, Seattle, and Hawaii will take place starting February 15, according to officials of the line. The first voyage will commemorate the third good-will tour of the **Seattle Chamber of Commerce.**

Hugh McKenzie, recently promoted to the position of General Passenger Traffic Manager, Dollar Steamship Co.

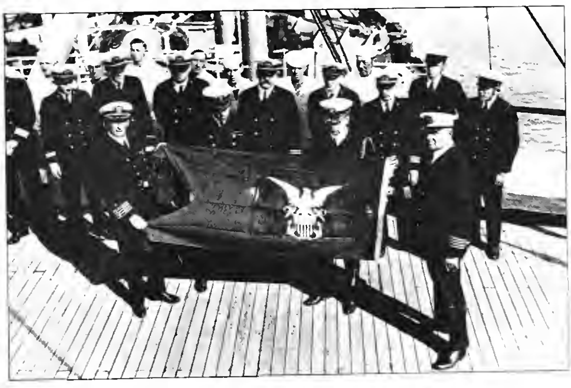
Earl D. Walker, formerly passenger agent for the McCormick Steamship Company at Portland, has been named general agent for the Matson Line at Chicago. He has held the post of travelling passenger and freight agent in the Mississippi Valley territory for about eight months.

Shipping circles of the Pacific Coast recently welcomed the announcement that **H. E. Coyle** had been appointed to the position of marine superintendent of the Mackay Radio and Telegraph Company. In his new capacity Coyle will have complete charge of all details pertaining to ships' radio equipment, radio compasses, and service repairs to both.

Coyle has a splendid record in the marine radio service in navy and commercial service, both at sea and shore-side, and his detail of marine repair men has always rendered highly creditable service.

Widows and orphans of the permanent staff of employees of the **White Star Line** will be given pensions under a new plan now being worked out by that steamship line. Officials of the company have decided to establish a "widows and orphans pension fund" and this will be in addition to the superannuation fund which has been in existence for a number of years .The superannuation fund takes care of the employees who retire upon reaching the age limit of 63.

The latest type of motorship constructed at the yards of Tama, Japan, by Mitsui & Company was a recent visitor to the port of San Francisco. The vessel was en route to New York with a cargo of raw silk. Christened the Hakubasan Maru, Mitsui flagship, the vessel is under command of **Captain Y. Umeda,** who has made many visits to this port and is well known to San Francisco shipping men.



Deck officers of the Lassco liner City of Honolulu, with their new United States Naval Reserve flag. In the foreground holding the flag are, left to right: Captain W. Pitt Scott, assistant commander of the Eleventh Naval District; Captain E. B. Fenner, commanding the U.S.S. Mississippi; Captain A. H. Woodbine, supervising inspector of the Eleventh Naval District; and Captain Arthur Self, master of the liner City of Honolulu.

When the steamer Oregon left Portland on January 5, she bore the ashes of **Captain Jack Methot**, who died in San Francisco during the holiday season, following an unsuccessful operation. Captain Methot commanded the Oregon when that vessel was known as the Oakridge. The last rites were performed by the master of the Oregon as the ashes were cast to the seas.

John C. Rohlfs, marine superintendent of the Standard Oil Company (Calif.) and vice-president of the Pacific American Steamship Association and director of the marine department of the Chamber of Commerce, Colonel **Allen G. Wright**, attorney for the Chamber of Commerce, and **Captain C. J. Saunders**, operating manager for the Matson Navigation Company are taking up the battle to secure a training ship for merchant officers for the state of California. Captain Saunders has interviewed Governor Young on the matter and has told the chief executive of the state the great success that Massachusetts has had with her training ship which has been sponsored by that state for the past thirty-seven years. There is an acute need for a training ship here, he states. Seventeen graduates of the Massachusetts schoolship were given berths on vessels of the American-Hawaiian Steamship Company. The cost to California would be about $70,000 annually, Captain Saunders states, as the federal government will provide a ship and $25,000 a year.

Captain John Follett of the Luckenbach Line, and holder of the intercoastal record for ships of that class, has been appointed coast pilot for the American-Hawaiian Steamship Company. Captain Follett will do duty between San Francisco and Los Angeles harbor. He will work with Captain O. M. Rogers, now acting as marine superintendent at San Francisco in the absence of Captain W. J. Kelton. Follett's record is 14 days, 4 hours, 25 minutes from New York to San Pedro, dock to dock. It was set by his command at that time, the Dorothy Luckenbach, in December, 1926, and has been unequaled since.

The announcement received by **Leo E. Archer**, Pacific Coast manager for the Panama-Pacific Line, from P. A. S. Franklin, president of the International Mercantile Marine Company, that the third liner, a sister ship of the steamers California and Virginia would be named the Pennsylvania occasioned some surprise in steamship circles.

Chief Engineer John Carstairs of the Panama Pacific liner Virginia.

There had been reports that the vessel would be christened the New York, but the advices from the East stated that decision to name the vessel Pennsylvania was due to the company's former affiliations with the port of Philadelphia and the desire to retain the ending "ia" to the names of ships of this line.

The liner is now under construction at Newport News and will be ready for the New York-California service in November of this year, according to President Franklin.

Chief Engineer George Whitehead, of the Panama Mail liner El Salvador.

John Carstairs, chief engineer of the Panama-Pacific liner Virginia states that his ship "spins like a top" below deck and that she is the finest liner in which he has had charge of the propulsion department. Carstairs is one of the veterans of the Panama-Pacific fleet and has been identified with the company for more than thirty years.

Captain R. W. Tucker, well-known Pacific Coast mariner, is now identified with the San Francisco offices of the Marine Underwriters.

Declaring that the action of the Shipping Board in assigning the liner President Roosevelt to the Ward Line for competition in the Havana-New York service with the Cunard Line is an illegal act, forbidden by the Shipping Act of 1910, **Robert H. Blake**, associate director of the British Company has written to **T. V. O'Connor** deploring the action of the Board. Blake declared in his communication that the allocation of the vessel to the Ward Line was an attempt to restrict foreign steamship companies from freely trading between two countries. The Cunarder Caronia has been placed in the service and the President Roosevelt as assigned sails on the same day, same hour, and from the same ports as the British ship. The rates on the British vessel are higher than those of the Ward line vessels.

The four-masted bark **Annie M. Reid** is to be dragged off the mud flats of the Oakland estuary and placed in the lumber trade between Pacific Coast ports and Australia. The vessel was recently sold by the James Rolph Company to **Captain L. M. Thorne.** The vessel is to be completely overhauled before entering the trade. **Captain I. A. Durkee's** devotion to this old sailing ship furnishes a rare tale for lovers of the sea. He brought the vessel from the Atlantic on her maiden voyage in 1910 and when the Rolph Company decided that her usefulness was ended he stayed with the old craft as caretaker. Out of his own earnings he bought paint to keep her housing neat, scraped her hull above the water-line and now, confident that she returns to serv-

ice, has packed his sea bag and dunnage and happily bids her farewell.

Steamship men who inspected the motorship Stanford upon her arrival in San Francisco on her maiden voyage expressed themselves as highly pleased with the structure of the craft. The Stanford is the first of several motorships built in Norwegian yards for the account of the Latin-American Line, for which **R. S. Silva and Company** are general Pacific Coast agents.

The Stanford is 404 feet in length, 8400 tons, and propelled by twin diesel engines. She is the vanguard of the new motorships to be named in honor of Pacific Coast universities.

Willmoto is the new name selected for the motorship Seekonk recently purchased by the **Williams Line** from the Quaker Line. The vessel will soon be in the hands of her new owners. The vessel will be placed in the intercoastal trade as an extra carrier.

January 5 marked the fifth year of the Dollar Line's advent into the round the world trade, with the sailing of the President Harrison from San Francisco. A luncheon on board the President Polk celebrated the notable event. **Captain Robert Dollar** was the guest of honor and tributes to the line were paid by prominent business and shipping men of San Francisco.

A number of promotions and changes in the executive personnel of the American-Hawaiian Steamship Company placed in effect January 1 by **Roger D. Lapham**, president.

John E. Cushing, traffic manager, was elevated to the position of Vice-President in Charge of Traffic, with supervision of all traffic affairs and agencies of the company both intercoastal and oriental, with headquarters in San Francisco.

W. S. McPherson was appointed Traffic Manager, located at New York.

F. W. Anderson was transferred from Boston to become New York Agent, succeeding the late **H. J. Kehoe.**

W. D. Clark will continue as assistant Traffic Manager, located at San Francisco and having supervision of all Pacific Coast traffic matters and agencies in the inter-

Captain L. J. Hall, popular skipper of the Matson liner Maui.

coastal service.

F. F. Allen is to continue as assistant Traffic Manager located at San Francisco and in full charge of the oriental traffic.

J. N. Levins, formerly assistant to **Mr. McPherson** in New York was assigned to Boston as Agent. **A. C. Schier** was shifted from Detroit to become assistant to Mr. McPherson. **R. S. McCurdy** succeeded Schier in Detroit.

The crack transpacific liner Malolo will sail from San Francisco in June on a booster tour to leading ports of the Pacific Ocean. **C. C. Moore** is head of the committee appointed by the San Francisco Chamber of Commerce to boost the trip, which is expected to be composed of three hundred San Francisco business leaders.

"**Billy**," a black crow and the pet of Chief Engineer **Christian Olson** of the Panama Pacific liner Mongolia, mysteriously disappeared while the vessel was passing through the canal. However, according to **First Assistant Engineer Jocko**, there was not much grief, other than that of Chief Olson, as "Billy" was the noisiest mascot that has ever been aboard the Mongolia.

Captain J. H. Roberts, president of the ship lining and stevedore company bearing his name in Portland, is back at his desk after three weeks' honeymoon tour. The bride was formerly **Mrs. Abigail L. Shaughnessy** of Portland. Captain Roberts is known to hundreds of shipmasters and steamship men up and down the Pacific Coast.

After serving for five years as Puget Sound pilot for the American Mail Line, **Captain R. D. McGillivray**, resigned and is now engaged in the same waters in the piloting business for his own account.

Charles B. Warren, widely known Seattle shipping man, has been appointed manager of **Alexander & Baldwin, Ltd.**, Northwest agent for the **Matson Navigation** Company, and the Australia and New Zealand services of the **Oceanic & Oriental** Navigation Company. He succeeds E. R. Adams, who is retiring.

E. W. Clark, executive vice-president of the Union Oil Company, receiving from Captain W. Pitt Scott, assistant commandant of the Eleventh Naval District, a Naval Reserve pennant for the tanker La Placentia. Captain J. H. Gunther, master of the La Placentia, is standing directly back of the flag, and in the background are the officers of the tanker: First Mate S. A. Ojstedt; First Assistant Engineer O. Anderson; Second Mate H. C. Magnusson; Third Mate O. W. Eckstrom; and Chief Engineer A. O'Flanagan.

Trade, Traffic, and Shipping

(Continued from Page 61)

Freights, Charters, Sales

January 17, 1929.

THE following steamers have been reported fixed with grain from the North Pacific to the U. K.-Continent: British str. Gracefield, Vancouver to Antwerp or Rotterdam, 33 6, Avonmouth, London or Hull 34/-; British str. Antar, 1 port Greece 36 6, Feb.; British str. King Alfred, Portland and Puget Sound to U.K.-Continent, Jan., Balfour Guthrie & Co.; British str. Pilar de Larrinaga, Vancouver to Antwerp and Rotterdam, 38 -, Feb., J. W. Mitchell, Ltd.; British str. Tresillian, Vancouver to one port Greece 38 6, 2, 3, or 4 ports discharge 6d. extra each port, Jan./Feb.; British str. Tiberton, Vancouver to Antwerp or Rotterdam, 32 6, Jan., L. Dreyfus & Co.; British str. Wentworth, San Francisco to U.K.-Continent, 37/6, two ports 38 9, February, Strauss & Co.; British str. King . . . , Portland to U.K.-Continent, 36/3, Jan. Feb.; a steamer, Vancouver to Lisbon, 34 -, Feb.-Mar., J. W. Mitchell Co.; a "K" Line str., Vancouver to Greece, 37 9, Feb., L. Dreyfus & Co.; British str. Jersey City, Vancouver to U. K.-Continent, 32/6, Antwerp or Rotterdam 32/-, Feb.; a steamer, Vancouver to Antwerp or Rotterdam, 31 -, Hamburg 31 9, Mar.; a steamer, Vancouver to U.K.-Continent, 32/6, Portland or Puget Sound loading 33/9, Mar./Apr.; British str. Holystone, Vancouver to Antwerp or Rotterdam 31 6, British Channel port 32/-, London or Hull 32 6, Jan./Feb., L. Dreyfus & Co.; British str. Paris City, Vancouver to U.K.-Cont., 33/-, Antwerp or Rotterdam 32/6, Jan./Feb.; a Japanese str., same, Feb.

The British str. Orient City is reported fixed with grain from Vancouver to Shanghai, Apr. loading, by L. Dreyfus & Co. and an unnamed steamer for the same business at $5, Apr. loading, by Canadian Cooperative Wheat Producers Assn.

The following lumber fixtures to Australia are reported: Danish str. Parana, Columbia River to Sydney, January, H. R. MacMillan & Co. and British str. Milluna, same, Mar. loading, J. J. Moore & Co.

The Japanese str. Ishin Maru is reported fixed from Puget Sound to Japan, $40,000 lump sum, Jan. loading, by Allen Shipping Co. and the American str. Joseph Dollar from Puget Sound to Shanghai, by the Robert Dollar Co.

The following tanker fixtures are reported: Norwegian m.s. Orkanger, California to Australia, Jan.; American str. Dean Emery, California to North of Hatteras, at or about 64c, middle Jan.; American str. Huguenot, California to Gulf, dirty, 50c, Jan.; American str. Watertown, California to North of Hatteras, 65c, prompt; Norwegian m.s. Lincoln Ellsworth, California to China, 2 trips, Feb. Mar.

The British str. Strathlorne is reported taken on time charter, delivery Newcastle, redelivery Australia via North Pacific, 3 9, Jan., by H. R. MacMillan Export Co.

The American tank steamer Brandywine is reported sold for $60,000 from the United States Shipping Board to Stanley Hiller and J. J. Coney, and the American steamer Georgina Rolph for $3650 from U. S. Marshal to A. L. Becker.

PAGE BROTHERS, Brokers.

Direct Mail to South America

THE West Camargo, first of the McCormick Pacific-Argentine-Brazil Line steamers to sail for the East Coast of South America carrying mail under the recent agreement between the Government and the steamship company, left San Francisco January 9 under the command of Captain Nils Carlson.

The West Camargo is the first steamer to leave the Pacific Coast of the United States carrying mail direct to Argentina and Uruguay, and the first consignment of mail will be the largest ever handled to the two countries either by rail or water. The Hon. Juan Carlos Godoy, Consul-General of the Republic of Argentina at San Francisco, has written an official letter to his government, which will be delivered personally by Captain Carlson to the Argentine authorities upon his arrival in Buenos Aires.

In the future the Post Office Department will assemble mail for several days prior to the regular sailings of the Pacific-Argentine-Brazil steamers every twenty days, parcel post and other mail matter destined for the countries mentioned to be transported regularly from the various ports of the Pacific Coast.

"Special notice should be taken of the fact that specially addressed first class mail, naming steamer sailing from Pacific ports of mailing will also be forwarded on Pacific-Argentine-Brazil Line vessels, otherwise first class mail will not be handled," according to announcement from the local office of the company. "This arrangement will enable shippers to forward bills of lading and other documents to consignees on the same steamer which carries the cargo."

With the addition of the two steamers West Ira and West Ivis, the steamship company will be enabled to maintain a sailing from all Pacific Coast ports every twenty days instead of every thirty days as in the past. Mail originating at all Pacific Coast ports will be forwarded by rail and assembled at Wilmington, where all ships of the line will call irrespective of cargo offering to pick up mail.

The Navigator or Mariners' Guide has been published by the New Jersey Paint Works, Jersey City, New Jersey. Price $2.

This is a handy reference work for the use of navigators, yachtsmen, and students of navigation, explaining how to find latitude and longitude by observation and contains also many other useful calculations, tables, and general information. It is compiled by Elmer B. Collins, master mariner.

Trade, Traffic, and Shipping

(Continued from Page 61)

Freights, Charters, Sales

January 17, 1929.

THE following steamers have been reported fixed with grain from the North Pacific to the U. K.-Continent: British str. Gracefield, Vancouver to Antwerp or Rotterdam, 33/6, Avonmouth, London or Hull 34/-; British str. Antar, 1 port Greece 36/6, Feb.; British str. King Alfred, Portland and Puget Sound to U.K.-Continent, Jan., Balfour Guthrie & Co.; British str. Pilar de Larrinaga, Vancouver to Antwerp and Rotterdam, 38/-, Feb., J. W. Mitchell, Ltd.; British str. Tresillian, Vancouver to one port Greece 38/6, 2, 3, or 4 ports discharge 6d. extra each port, Jan./Feb.; British str. Tiberton, Vancouver to Antwerp or Rotterdam, 32/6, Jan., L. Dreyfus & Co.; British str. Wentworth, San Francisco to U.K.-Continent, 37/6, two ports 38/9, February, Strauss & Co.; British str. King . . . , Portland to U.K.-Continent, 36/3, Jan./Feb.; a steamer, Vancouver to Lisbon, 34/-, Feb./-Mar., J. W. Mitchell Co.; a "K" Line str., Vancouver to Greece, 37/9, Feb., L. Dreyfus & Co.; British str. Jersey City, Vancouver to U. K.-Continent, 32/6, Antwerp or Rotterdam 32/-, Feb.; a steamer, Vancouver to Antwerp or Rotterdam, 31/-, Hamburg 31/9, Mar.; a steamer, Vancouver to U.K.-Continent, 32/6, Portland or Puget Sound loading 33/9, Mar./Apr.; British str. Holystone, Vancouver to Antwerp or Rotterdam 31/6, British Channel port 32/-, London or Hull 32/6, Jan./Feb., L. Dreyfus & Co.; British str. Paris City, Vancouver to U.K.-Cont., 33/-, Antwerp or Rotterdam 32/6, Jan./Feb.; a Japanese str., same, Feb.

The British str. Orient City is reported fixed with grain from Vancouver to Shanghai, Apr. loading, by L. Dreyfus & Co. and an unnamed steamer for the same business at $5, Apr. loading, by Canadian Cooperative Wheat Producers Assn.

The following lumber fixtures to Australia are reported: Danish str. Parana, Columbia River to Sydney, January, H. R. MacMillan & Co. and British str. Milluna, same, Mar. loading, J. J. Moore & Co.

The Japanese str. Ishin Maru is reported fixed from Puget Sound to Japan, $40,000 lump sum, Jan. loading, by Allen Shipping Co. and the American str. Joseph Dollar from Puget Sound to Shanghai, by the Robert Dollar Co.

The following tanker fixtures are reported: Norwegian m.s. Orkanger, California to Australia, Jan.; American str. Dean Emery, California to North of Hatteras, at or about 64c, middle Jan.; American str. Huguenot, California to Gulf, dirty, 50c, Jan.; American str. Watertown, California to North of Hatteras, 65c, prompt; Norwegian m.s. Lincoln Ellsworth, California to China, 2 trips, Feb./Mar.

The British str. Strathlorne is reported taken on time charter, delivery Newcastle, redelivery Australia via North Pacific, 3/9, Jan., by H. R. MacMillan Export Co.

The American tank steamer Brandywine is reported sold for $60,000 from the United States Shipping Board to Stanley Hiller and J. J. Coney, and the American steamer Georgina Rolph for $3650 from U. S. Marshal to A. L. Becker.

PAGE BROTHERS, Brokers.

Direct Mail to South America

THE West Camargo, first of the McCormick Pacific-Argentine-Brazil Line steamers to sail for the East Coast of South America carrying mail under the recent agreement between the Government and the steamship company, left San Francisco January 9 under the command of Captain Nils Carlson.

The West Camargo is the first steamer to leave the Pacific Coast of the United States carrying mail direct to Argentina and Uruguay, and the first consignment of mail will be the largest ever handled to the two countries either by rail or water. The Hon. Juan Carlos Godoy, Consul-General of the Republic of Argentina at San Francisco, has written an official letter to his government, which will be delivered personally by Captain Carlson to the Argentine authorities upon his arrival in Buenos Aires.

In the future the Post Office Department will assemble mail for several days prior to the regular sailings of the Pacific-Argentine-Brazil steamers every twenty days, parcel post and other mail matter destined for the countries mentioned to be transported regularly from the various ports of the Pacific Coast.

"Special notice should be taken of the fact that specially addressed first class mail, naming steamer sailing from Pacific ports of mailing will also be forwarded on Pacific-Argentine-Brazil Line vessels, otherwise first class mail will not be handled," according to announcement from the local office of the company. "This arrangement will enable shippers to forward bills of lading and other documents to consignees on the same steamer which carries the cargo."

With the addition of the two steamers West Ira and West Ivis, the steamship company will be enabled to maintain a sailing from all Pacific Coast ports every twenty days instead of every thirty days as in the past. Mail originating at all Pacific Coast ports will be forwarded by rail and assembled at Wilmington, where all ships of the line will call irrespective of cargo offering to pick up mail.

The Navigator or Mariners' Guide has been published by the New Jersey Paint Works, Jersey City, New Jersey. Price $2.

This is a handy reference work for the use of navigators, yachtsmen, and students of navigation, explaining how to find latitude and longitude by observation and contains also many other useful calculations, tables, and general information. It is compiled by Elmer B. Collins, master mariner.

Fuel and Safety

(Continued from Page 57)

of a vessel being loaded or light. When coal bunkers are full these lines may not be accessible and the rupture of a pipe or flange will, depending on the extent of the damage, precipitate the contents into the coal bunkers if pressure is on the pumps, or may permit the inflow of sea water from overboard. Some of these pipe lines are fitted with hinged clapper valves on the shell of the ship whose function is to prevent the sea water from entering the overboard discharge lines and backing up through the pipe lines.

According to reports, when the Vestris sailed on her fatal voyage, she carried her full supply of coal for the round trip, most of which was carried in bunkers above the fire-room floor level, burying numerous of the overboard discharge lines passing through these bunkers, and making them inaccessible. Ash ejectors are used on board coal burning ships to dispose of the ashes overboard by water under high pressure; the discharge is either through an opening in the side of the ship or, in some cases, through the bottom of the ship. Testimony was given tending to show that the ash ejector in the stokehold of the Vestris, whose discharge pipe passed through the coal bunkers, began to leak badly, allowing water to enter in sufficient quantities to fill the starboard fire room bilge; also, that a scupper plate on one of the sanitary pipe lines carried away, which permitted the sea to back up through the line into the ship. It was reported that men had to strip and plunge into the water to free scuppers in the ship and suction line strainers from coal.

One of the chief advantages of oil, as previously stated, is the ease with which it is carried in the double bottoms of the ship. With the exception of the lines from the double bottoms to the suction side of the fuel transfer pump or of the fuel pump (none of which have a direct sea connection) pipe lines are not usually located in these double bottoms and hence the attendant disadvantages of this undesirable feature are eliminated. Witnesses in the Vestris case testified that the exact location of the leaks was not known. Where ruptured seams or rivets in the fuel tanks of oil burning ships occur, it is usually possible to at least approximately determine the location of such a leak by the seeping of oil into the sea. Fuel oil can also be pumped overboard for the purpose of smoothing the sea or quelling the force of the waves in case of emergency.

Every seagoing vessel, depending on her size, is required by law to have a number of water-tight cross-bulkheads, as well as fore and aft bulkhead compartments, sustained upon suitable frame-work and properly secured to the hull for the purpose of safety in the event of a collision. Many vessels have met with disaster through faulty bulkheads. Corrosion, aboard ship as elsewhere, is effected more rapidly under conditions where metals are not properly cared for and protected. It is promoted quickly under atmospheric conditions of heat and moisture; the very factors which are present in the fire rooms of coal burning ships, as well as in their coal bunkers. The necessary practice of wetting down the clinkers and hot ashes when fires are cleaned and hauled causes the formation of sulphuric acid, which rapidly attacks the floor plates and sections of bulkheads where this refuse is currently piled, requiring renewal of these parts at relatively frequent intervals.

The Vestris, of course, was fitted with watertight bulkheads and had all of these been in first-class condition the vessel would probably have continued to float. Testimony was given to show that the final blow the ship sustained and which caused her ultimate loss was due to the collapse of the coal bunker bulkheads. When these bulkheads gave way, large volumes of water spread to the adjacent compartments, and as the weight to starboard increased, the vessel finally foundered.

Oil carried as fuel in the double bottoms or in tanks, has none of the disadvantages previously referred to. It should be noted that much of the space contained within double bottoms exists between the floors of the ship which internally support the bottom plates of a vessel, and while this space exists, between the ceiling of the ship's hold and the outer plating of the vessel's bottom, no use was made of this space prior to carrying fuel oil than as a receptacle for the accumulation of bilge water. It is customary and necessary to coat all surfaces of such spaces on coal burning vessels with cement to protect them against oxidization incident to their being bathed more or less continuously with bilge water, invariably impregnated with the impurities common to the drip from every known variety of cargo. Fuel oil does not have a detrimental effect on the plates and structural members of compartments and tanks used for carrying this product and they are not painted to protect them against corrosion.

One of the most prolific dangers in the carrying of coal, whether as fuel or cargo, is spontaneous combustion. The reports of bunker fires aboard ships have been without number while direct loss of vessels on the high seas because of spontaneous combustion fires has been reported. A secondary effect of coal fires in bunkers (such fires at times burn for days before digging out of coal will permit access to the seat of the fire) when these occur at or near the shell plating or bulkheads is that they will cause expansion and contraction of material and have an embrittling effect on the plates in the immediate vicinity. In fuel oil tanks, both bunker and cargo, there is insufficient air present to support combustion, and fuel oil in bulk is therefore not only incapable of spontaneous combustion, but also very difficult to ignite.

The economic side of steamship operation is, of course, of paramount importance and in certain instances owners may feel that too many restrictions shall not be placed on commercial shipping in the zeal to emphasize safety of passengers. The latter, however, justly demand that every necessary precaution be taken to insure their safety while at sea.

Many comments are heard concerning the deterioration in sea personnel and the era of incompetence in the handling of ships. It is undoubtedly true that there is today more hurried and scrambled assembling of ships' crews between voyages than ever in the past. With such a condition, it is of the greatest importance to the safety of ships that they be propelled with modern machinery together with its subsequently smaller crews of high caliber personnel. From the viewpoint of safety, as well as economy, the many advantages in the use of oil over coal makes it the logical choice of ship owners and operators in their progress to insure maritime safety.

Pacific Marine Review

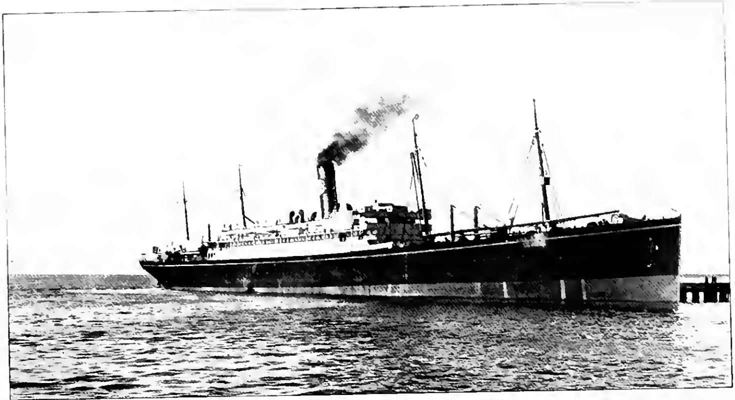
The National Magazine of Shipping

MARCH, 1929

Official Organ
PACIFIC AMERICAN

Official Organ
SHIPOWNERS' ASSOCIATION

Pacific Marine Review, Vol. 26, No. 2, Published Monthly at 576 Sacramento Street, in San Francisco. Entered as second class matter at the post office at San Francisco under the act of March 3, 1879.



[Photo by E P Griffith, Newport News]

[Photo by Lauck, San Francisco]

The Dollar Round-the-World Liner *President Johnson* and her beautiful new first-class Lounge after recent remodeling

Pacific Marine Review

The National Magazine of Shipping

Official Organ
Pacific American Steamship Association

James S. Hines,
President and Publisher.

Bernard N. De Rochie,
Vice-Pres. and Manager.

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

Entered as second class matter June 20, 1913, at the post-office, San Francisco, under the Act of March 3, 1879. Entire contents copyright, 1928, by J. S. Hines. Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 15th. Subscription price, a year; domestic, $2; foreign, $3; single copies, 25c.

Official Organ
Shipowners' Association of the Pacific

Alexander J. Dickie,
Editor

Paul Faulkner,
Advertising Manager.

Shipping Board Sells United States Lines

Leviathan and Her Running Mates Now to Be Under Private Operation

THE Shipping Board, with the approval of the Senate, has accepted the $16,300,000 bid for the United States Lines and the American Merchant Lines of their passenger and freight services. This bid is made by a New York syndicate headed by the banking and investment brokerage firm of Paul W. Chapman & Company. The bid, analyzed, amounts to $6,782,000 for the Leviathan; $1,000,000 for the Republic; $2,000,000 for the George Washington; $2,000,000 for the America; $1,000,000 for the President Harding; $460,000 for each of the five freight and passenger vessels of the American Merchant Lines and $218,000 for the various leaseholds of the United States Shipping Board Merchant Fleet Corporation in connection with the operation of these vessels.

The bid complied exactly with the specifications and the draft of contract prepared by the Merchant Fleet Corporation, without alteration or amendment, and agrees to operate the vessels in their present services for ten years and to build two new vessels of at least 45,000 gross tons each, work to be started within two years. These vessels are estimated to cost approximately $28,000 000 each.

The Shipping Board and the Merchant Fleet Corporation have apparently investigated thoroughly the financial standing of the backers of this bid and the adequacy of their guarantees before making the award.

The Board is to be congratulated upon this sale, which relieves it of the responsibility of carrying on a service that has been consistently losing money and which also, incidently, lines up the Board squarely with the American policy of private operation of the merchant marine.

One cannot contemplate these figures, however, without being tempted to do a little reverse arithmetic. Had the Board not been prevented by injunction some seven years back, from selling the Leviathan to the International Mercantile Marine Company at a price of $3 000,000, we figure that the Board would now be some $20,000,000 better off. It might be pertinent for some of the Senate investigating committees to find out if there is not room for a suit to collect damages from those responsible for the loss entailed through the operation of that injunction.

We are glad, however, that the sale has been made and we feel quite sure that in the competent hands of Mr. Sheedy as operating manager the new combination will soon cut down operating losses and possibly begin to make some profits.

Marine engineering and naval architecture have made great strides since the Leviathan was first built and the propulsive equipment of large steamers built today would show a very much better fuel economy and obtain the requisite horsepower with much less sacrifice of weight and space than was the case fifteen years ago. So that while the cost of construction has advanced in a very marked degree, the product obtained is a much less costly machine to operate.

Success to the United States Lines and to their new owners!

"The foreign trade of the United States for 1928 continued its development. In value it was more than $9,200,000,000. In volume it was about 114,000,000 tons."

James A. Farrell.

Unfair Government Competition

WITH the federal government pledged to the people to retire as promptly as is practicable from merchant marine operation, and with the Shipping Board bending all of its energies in that direction, we are gradually getting back to 100 per cent. private operation on the seven seas. However, one very sore spot remains and that spot is outside the jurisdiction of the Shipping Board and apparently outside any intention of Congress to apply thereto the provisions of the Merchant Marine Act. This spot is the group of steamers owned and operated by the Panama Railroad Company.

Complete control of the Panama Railroad Company is held by the government of the United States. Its officials are all officials of the Panama Canal. It has complete control of the commercial docks at Cristobal and Balboa, of stevedoring operation thereon, and of

ship repair plant and dry-docks at Balboa. Through its own ships it is in direct commercial competition with privately owned American ships. Its own ships are naturally given preference in berths, in turn around, and in repairs.

This corporation, not content with cutting rates in direct competition, has become the commercial transshipping agent for some thirty foreign lines, and ships of these lines are said to be getting preferred treatment over ships of other foreign lines and ships of American lines.

Commercial agents of the Panama Railroad Company actively advertise the advantages of this preference in various ports of the West Indies, Central America, and northern South America.

It would certainly seem that Congress should put an end to these unfair competitive practices of a government agency, especially since the Panama Railroad Steamship Lines are not in any way necessary and are operating at a heavy loss.

Twenty Years of Naval Architecture

DOCTOR Foerster, well known German naval architect, in a recent paper reviewed the progress of naval architecture and marine engineering during the past two decades.

As regards the general economy of a ship considered as a cargo carrier, he found that owing to improved methods of construction and advances in metallurgy, there has been a reduction in the weight of steel required for a ship's hull of fully 10 per cent. The space available for cargo has been increased in an even greater degree by the increase in girder height of the hull.

At the same time, thanks to the advances in research at the experimental tanks, the form of hulls has been improved, together with design of propellers and of outboard struts, bosses, etc., to such an extent that about 20 per cent less propulsive power is required than was necessary twenty years ago. In marine engineering there have been instances of weight reduction for propulsion machinery of as high as 68 per cent. (Oil-fired water-tube boilers and geared turbined at high pressures and superheats compared with reciprocating engines and coal burning Scotch boilers.)

Dr. Foerster estimates that the combined effect of improvements in naval architecture and marine engineering make it possible to transport twice as much cargo at the same speed with the same power as compared with twenty years ago.

There is still ample room for improvement, and both naval architects and marine engineers are going after betterments today more keenly than at any time in the history of their professions.

Steam Very Much Alive

A TREMENDOUS amount of very intense research has been and is being done on steam. This simplest, most familiar, and possibly most useful of all gases is constantly revealing to the scientist and the engineer new ranges of economies and uses.

Reviewing this work the February issue of "Mechanical Engineering" comments as follows:

Practice is always forging ahead of basic knowledge. A century and a half ago James Watt knew deplorably little about the properties of steam, and what he knew was only approximate, such as the crude rule that a cubic inch of water will make a cubic foot of steam. In spite of this he was responsible for the greatest invention in the history of the steam engine.

Watt's early work was with engines using steam at atmospheric pressure. There are still alive men who have operated engines on steam at 30 pounds per square inch pressure. Even comparatively young men can remember "high pressure boilers" designed for steam at 70 to 100 pounds per square inch.

But theorists have always pointed out the superior efficiency of engines operating with steam at high pressure and temperature, although until comparatively recently the necessity has not been sufficiently urgent to warrant the expense of the turbines and boilers for these conditions.

About eight years ago, designers being reluctant to produce turbines for high pressures because of their ignorance of the properties of steam, a group of research workers at Harvard, Massachusetts Institute of Technology, and the United States Bureau of Standards, cooperating under the auspices of the American Society of Mechanical Engineers, and with the help of the engineering industries, united to extend our knowledge of steam into the high-pressure regions. Working independently and on different phases of the problem, but in such a way that the results obtained by one would act as a check on those of the others, the researchers have proceeded to such a point that J. H. Keenan is able to present the principal data covering the entire range up to the critical pressure of 3200 pounds per square inch. In a supplementary report which reviews similar work done by Knoblauch in Germany and Havlicek in Czechoslovakia, Professor Keenan points out that the European investigators substantially corroborate the American work.

Once again science has almost caught up with industry.

Isherwood Progress

SIR Joseph W. Isherwood, Bt., has had a busy year during 1928. The three systems of hull construction bearing his name—The Isherwood System, The Isherwood Combination System, and The Bracketless System—have even during this rather lean shipbuilding year added to the Isherwood register 45 vessels with an aggregate deadweight tonnage of 261,540.

Since September 1907 the Isherwood fleet has grown steadily. December 1908 registered six hulls of 31,608 tons total deadweight carrying capacity, December 1918, 1050 hulls with 8,707,700 tons total deadweight carrying capacity, and December 1928, 1653 hulls with 13,752,-920 tons total deadweight carrying capacity.

While the Isherwood system is especially adaptable to tankers, it is interesting to note that less than one-half of the total number of hulls that have been built to this system were for bulk oil transport. The tanker total is 822 hulls of 7,728,450 tons total deadweight carrying capacity. The 831 hulls remaining include passenger liners, general cargo vessels, colliers, ore steamers, Great Lakes freighters, ferryboats, barges, dredges, and other types.

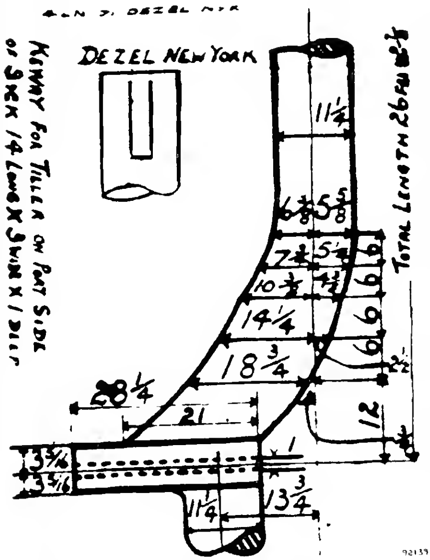
The largest vessel included in the 1928 additions to the Isherwood list is the tanker C. O. Stillman, 21,250 tons deadweight carrying capacity. This vessel, built on the Bracketless System by Bremer-Vulcan and equipped with diesel engines by Krupp, is in fact the largest tanker yet built. She is owned by the Imperial Oil Company of Canada.

The steady progress maintained in building up this remarkable record proves that the operators of these hulls recognize distinct merits in the Isherwood systems and appreciate those merits.

Ship Repair by Radio

RECENT severe gales on the Atlantic developed, in the case of one cargo liner, a rather interesting and unusual method through which modern radio developments are able to save time and money for merchant marine carriers. The instance is all the more interesting in that it is international in its application.

On Saturday, January 26, when the great storm had about spent its force, the Kerr Line office in New York received a message from its cargo motor liner Silvermaple stating that her rudder stock had been damaged and that she needed assistance. The position given was about 700 miles from New York and 500 miles from Boston, the vessel being en route to New York. The United States revenue cutters Mojave and Tampa were dispatched from Boston to stand by. The Silvermaple was able to proceed under her own power, but lacked steering control. She was directed to proceed to Bermuda.



Radio photograph of sketch showing dimensions of rudder stock for motorship Silvermaple.

Then the Kerr Line officials sent a radiogram to England, through the Radio Corporation of America, asking for detailed sketches from the original plans so that the new rudder stock could be built at New York. In a few hours the necessary sketches had been made by the draftsmen and sent by radio photograph to New York. Less than 48 hours after the original message had been received plans were in the hands of the Sun Shipbuilding Company at Chester, Pennsylvania, and work was started on the new rudder stock.

The Silvermaple limped into Bermuda February 6, and work was begun immediately dismantling the damaged rudder stock. The new rudder stock arrived at Bermuda February 11, was installed immediately, and the vessel cleared for New York, where she will be docked for complete survey.

The Kerr Line officials estimated that the transmission of these sketches by radio had saved more than a week's time and at least seven thousand dollars.

High Speed Lifeboats

FREQUENTLY after a marine disaster some misguided attorney or preacher will come forward with a suggestion for the improvement of lifeboats or life saving apparatus. These suggestions are usually accompanied by a brief, the prelude of which will assert that, "No improvement having been made in lifeboats since the days of the Phoenicians, the author has decided to come to the assistance of suffering humanity and design a real lifeboat."

The fact is, of course, that every civilized maritime nation has a well equipped and manned department whose sole aim is the improvement of life saving apparatus. These departments do not greatly advertise their achievements, but they are constantly and quietly making advance, by the test method. Here, for instance, is a recent development of the British Royal National Lifeboat Institution.

This corporation, which is supported entirely by popular subscription throughout Great Britain and Ireland, has decided to station at Dover, for service to cross-channel steamers and planes, the largest and fastest power lifeboat in the world. This boat will be 64 feet long with a beam of 14 feet. She will have two enclosed cabins with room for fifty persons, in addition to the crew. She will be equipped with two engines of 375 horsepower each, giving her a sea speed of 17 to 18 knots an hour. Aeroplanes forced down in the channel or cross-channel steamers in distress will now be promptly served.

The new boat will be electrically lighted and equipped with wireless receiving and transmitting set of a 50-mile range.

The Europa and Bremen, 47,000-ton liners of the North German Lloyd now nearing completion are to have all their lifeboats of large size, all equipped with gasoline motor propulsion, and all equipped with wireless. Each of these boats will be slung on its own pair of modified Maclachlan type davits ready to be swung off at a moment's notice and all handled by power winches.

Safety from marine hazard for ship, for crew, and for cargo is progressing steadily, and passenger safety at sea compares very favorably with that for any mode of transportation ashore.

New York Port Problems

Some Observations on the Influences Now at Work Drawing Trade Away from New York Harbor and Some Suggestions for the Defense of that Port

By Norman F. Titus,
General Manager, New York-New Jersey Business Associates*

THE Port of New York has been a popular subject for discussion for many years; addresses and articles without number have described it and dealt with the facilities and traffic of this, the world's largest port. Furthermore, commissions and associations, both commercial and economic, have made extensive surveys and analyses of the problems of this great harbor. These efforts have resulted in an enormous literature upon the subject. In spite of all the time and effort that have been expended, the conditions in the Port of New York seem to be most acute; even a casual observer is convinced of the presence of an appalling amount of inefficiency and waste. The seriousness of this situation from the standpoint of good business is very evident, but there are other factors of outstanding importance that are bringing affairs in the Port of New York to a veritable crisis, and will no longer permit of further evasion or procrastination in applying a remedy.

A Beleagured City

The Port of New York is beleaguered as literally as was many an ancient city. Petty jealousies and strife have existed internally so that the outward walls have been largely neglected. Meanwhile, the enemy has been gathering without and is now figuratively storming the battlements. These are desperate times, and it is important that something be done at once or the enemy will scale the walls and plunder this district of its great riches.

New York has been living in a fool's paradise. It has handled as much as 50 percent of the total foreign commerce of the United States and possessed an extensive coastwise commerce as well. In its enormous shipping, banking, insurance, and brokerage facilities, it has felt secure from all attack from other domestic ports. During the last decade, however, ports on the Atlantic and Gulf have been preparing for an onslaught. The method they have been pursuing has been to expend millions of dollars upon their terminal facilities and to provide the best possible equipment so that their terminal costs would be at a minimum. By means of modern equipment and wise planning, these rival ports have succeeded in getting their terminal costs much lower than those of New York. The attack upon the Port of New York has taken the form of complaints by competitive ports to the Interstate Commerce Commission and other tribunals in which it has been pointed out that the terminal charges of New York are excessive and the tribunals are asked to grant allowances or differentials to the complainants commensurate with the cheapness of their terminal services.

Defense of Port

According to an official statement, 30 percent of the time, effort and money of the Port of New York Authority has been expended in defending the Port of New York from the attacks of other ports.

In comparing this district to a beleaguered city and carrying out the simile still further, it should be pointed out that the besieged held a Council of War on November 27, 1928, to devise means of defense from these vigorous attacks. This Conference on Protection of the Commerce of the Port of New York was called by the Port Authority and was attended by representatives of approximately one hundred and twenty-five commercial associations. The Port Authority's legal staff pointed out that "at no time in the history of the railroads in the United States has there been such a concerted effort on the part of rival ports to injure the Port of New York and divert commerce from that port."

A review of the situation disclosed many suits pending against the Port of New York, the principal ones being the following:

1. **Baltimore Differential Case, I.C.C. Docket 18715:** Baltimore, by formal complaint to the Interstate Commerce Commission, is asking to have doubled the present port differentials, which means that New York will be handicapped twice as much as it is now in competition with Baltimore. The complaint rests on the theory that terminal costs at New York are excessive, and should be reflected in the rates.

Philadelphia has joined with Baltimore and is demanding a doubling of their differentials on the same theory.

In this case the hearings have been held and the examiner has recommended that the differentials be granted.

2. **Gulf Import and Export Case, I.C.C. Fourth Section 2040, et al:** The southern railroads, with the support of the port interests from Charleston to Galveston, have joined in a petition to the Interstate Commerce Commission for permission to maintain import and export rates to and from central territory in violation of the long and short haul clause of the Commerce Act. They ask permission to maintain rates to territory north of the Ohio River, which are in some cases only slightly more than half as large as the rates to intermediate territory south of the river, and which are substantial differentials under the New York rates. The avowed purpose of this proceeding is to divert as much tonnage as possible from the Port of New York and other north Atlantic ports.

3. **Port Charges Investigation, I.C.C. Docket 12681:** The southern ports and some of the north Atlantic outports, with the assistance of counsel for the United States Shipping Board, in a proceeding before the Interstate Commerce Commission, have asserted that terminal charges should be segregated from line haul charges. It is contended that lighterage and floatage are accessorial services over and above line haul delivery for which an additional charge should be made to the shipper or consignee.

4. **Eastern Class Rate Investigation, I.C.C. Docket No. 15879.** This is an investigation instituted by the Commission with the aim of devising a new scheme and basis of class rates within the Eastern Trunk Line territory. At present the reports of the examiner recommend an arbitrary mileage to be added to the New York zone rates on account of the excessive cost of lighterage in the Port of New York.

In addition to the cases stated, Boston is joining with Philadelphia and Baltimore and contending that, in

*Address before the Propeller Club of the Port of New York, January 31, 1929.

spite of Boston's substantial disadvantage in distance, she should enjoy lower freight rates than New York because of the excessive terminal costs at New York.

Even in our own back yard, Albany is endeavoring to capitalize on New York's weakness, for at a recent hearing in the House of Representatives relative to federal aid for deepening the Hudson River it was stated that, "Albany is a great railroad terminal, and it will allow the transfer directly from cars to the ships, and will save much in terminal charges over handling in the Port of New York, where a lighterage system is a necessity. It will make quite a saving in these terminal charges and also relieve congestion."

Must Reduce Costs

Decisions in these cases are due within a few months, and present indications are that they will be unfavorable to New York. In such a grave crisis temporizing should no longer be tolerated—costs in the Port of New York must be reduced. The real issue is, therefore, reduce the cost of doing business in the Port of New York or prepare to see huge tonnage go to other ports which can handle cargo cheaper.

Already New York's share of the total foreign commerce of the United States has dwindled from more than 50 percent to less than 42 percent. Furthermore, Interstate Commerce Commission Examiner Trezise finds port costs as follows:

At Hampton Roads the cost per ton of 2000 pounds is $1.05; at Baltimore $1.06; at Philadelphia $1.10; at New York $2.75; at Boston $1.85; and at Portland, Maine, $0.47. These are not direct costs to the shipper, but are costs to the carrier for performing the terminal services. Obviously, however, they must be reflected in the rate structure.

Ways of Reducing Costs

With such a situation confronting the Port of New York, let us consider the facts and determine in what manner costs can be reduced. The lighterage question should first demand our attention, because it is New York's shortcoming in this operation that forms the basis of most of the suits against her.

In considering lighterage, a distinction should be made as between car-floatage, switching, and lighterage. Car-floatage is a recognized extension of the line-haul operation and decisions are numerous, fully justifying this particular practise. Time does not permit of an argument as to the difference between switching and lighterage. However, it may be stated that an analysis of the lighterage operation discloses that it differs from switching in at least six major particulars and produces high costs that have no counterpart in the delivery of freight by means of switching service. Thus, it can be stated that while car-floatage and switching are justifiable extensions of the line haul, the extensive practise of free lighterage as it exists in New York harbor is illegal and unjustifiable.

Free Lighterage Service

Free lighterage service in the Port of New York is rendered by the railroads for a distance of 18 miles and means, virtually, that the trunk lines are maintaining terminals at 700 steamship piers in New York harbor.

This lighterage practice had its genesis in two different series of circumstances. First, the New York Central and Hudson River Railroad was the only railroad having tracks on Manhattan Island. The other railroads, operating to the south and west, had their terminals in New Jersey, and, as the New York merchants controlled both the foreign and domestic business, these railroads had to render free lighterage service to compete with the New York Central. The second act of circumstances arose from an entirely different situation. In the de-

An excellent aerial view of The Battery and the Hudson River piers on Manhattan Island

cision of the New York Harbor Case of 1917, we are informed that the lighterage allowances primarily evolved from certain rebate practices. In short, the carriers prior to the enactment of the statute which first made rebates unlawful, gave certain rebates to sugar refineries to compensate them for lighterage of sugar between Brooklyn and Jersey City. The present allowances and charges for lightering all kinds of freight to and from steamship lines and to and from private docks and plants at various points in New York Harbor, including split deliveries, are rates which, prior to the year 1887, were deemed to be appropriate compensation for lightering a commodity of exceptionally large volume from Brooklyn to Jersey City.

Both of these causes for free lighterage in New York Harbor no longer exist or are valid in any respect. With the growth of New York, the New York Central could no longer handle its business on Manhattan and thus acquired the West Shore Railroad and, at present, approximately 90 percent of its export freight and 75 percent of its domestic freight is handled on the Jersey side. Furthermore, by means of the perfectly justifiable car-floatage system, the railroads are now on a parity in the harbor. Concerning the phase of the lighterage operation which arose from the old sugar rebate system, this is probably the only rate practice that is a hold-over of the days prior to the passage of the Interstate Commerce Act. Speaking generally, it can be conclusively shown that the free lighterage allowance has extended into trade service not permissible under our transportation laws. The essence of the situation is that car-floatage and switching are orthodox practices, but the transportations should stop with the car, and when the car-seal is broken transportation should end and subsequent lighterage should be paid for by those receiving the benefit of the lighterage operation.

Cost of Lighterage

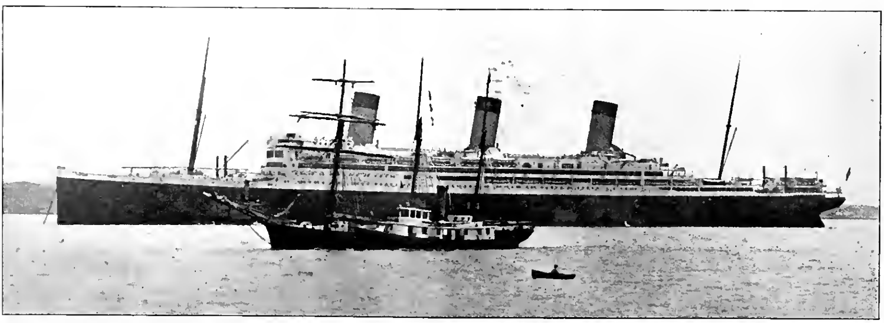
Another consideration of vital importance is the cost of the free lighterage operation. Figures filed with the Interstate Commerce Commission for the year 1923 disclose an average cost to all the railroads of \$2.75 a ton. Information privately available for the year 1924 shows an average cost of \$2.60 per ton; but close scrutiny reveals that this cost covers marine operation only, and additional charges must be made for loading and unloading the lighters, probably a dollar a ton, also interest, depreciation, insurance, and taxes on all equipment and lighterage terminals, also administrative expenses.

In the case of the Pennsylvania Railroad, the average lighterage cost is admitted to be \$3.31 per ton. When the cost of the longer haul lighterage is compiled, it will be discovered that costs of \$5 to \$10 per ton abound. On interline lightered traffic transported by the Pennsylvania Railroad in conjunction with its connecting lines the Pennsylvania deducts 4 cents per 100 pounds for its lighterage service before prorating the charges at established divisions of the joint rates. Thus it is that while the lighterage costs the Pennsylvania \$3.31 a ton, its compensation is but 80 cents a ton; the net loss of \$2.51 is necessarily imposed upon other Pennsylvania Railroad traffic. This showing is typical of the lightered interline traffic of the six other trunk lines.

A further examination reveals another aspect of this situation. A large tonnage of export traffic is transported at the 4th, 5th, and 6th class rates. The fifth class rate from Pittsburgh to New York is 34 cents for 100 pounds, or \$6.80 per ton. The average expense of performing lighterage service in the case of the Pennsylvania Railroad has been shown to be \$3.31, thus constituting approximately 41 percent of its revenue under the fifth class rate. Obviously, the lighterage service is an extraordinary terminal service.

Free Lighterage Unjustifiable

The average amount of free lighterage annually is approximately 11,000,000 tons, and although the marine expense is admitted to be about \$25,000,000, it is quite evident that the total expense of the railroads is approximately \$50,000,000. The railroads absorb this amount, but who really pays for it? Why, the general shipper. The \$50,000,000 is taken out of the general treasury of the railroads, and all the line traffic has to bear its proportion to make good this allowance. This principle is reflected in the impending decision in the Eastern Class Rate case wherein an arbitrary mileage is added to the actual mileage in the New York zone to compensate for this excessive lighterage cost. In other words, in the Eastern Class Rate decision the Commission evidently intends to place the lighterage burden on the New York and New Jersey territory.



The largest and finest ships afloat were built for New York-Europe service. Here is an unusual view of the White Star liner Majestic in New York harbor.

As the free lighterage system is so unjustifiable and is also the primary cause of New York's vulnerability to attacks from other ports, it should be eliminated at once. Lighterage should continue to be given, but those benefitting by it should be obliged to pay the cost. In other words, if a shipper routes his freight from a railroad terminal in New Jersey to a ship in Brooklyn and requires lighterage service, he should pay the cost of the lighterage. This method would result in the development of ship terminals and industries in New Jersey and would bring about that absolute necessity for New York Harbor—co-ordination of rail and ship.

Modern Piers Needed

A great deal more could be said on the subject of lighterage. However, it is necessary to recognize that there are many other factors that affect the high cost of doing business in the Port of New York.

Modern piers should be constructed; the move of the Pennsylvania Railroad in announcing the construction of a new $50,000,000 terminal in Jersey City is a move in the right direction. Such modern terminals are urgently needed, and if properly supplied with up-to-date mechanical equipment will provide the Port of New York with facilities to make alluring terms to the great body of shippers who would naturally be disposed to use this great waterway.

In the modernization of this port, the best experience of American industry should be followed. Safety engineering, as it is understood and practised in our largest industrial concerns, should be introduced and followed in New York Harbor. By reducing the number and severity of accidents, not only will the dictates of humanity be followed, but insurance rates will be reduced. The high cost of accident insurance in the Port of New York is a distinct handicap; the Department of Commerce estimated that there exists in the port $9,000,000 of such avoidable waste. The Department of Labor is making a noteworthy study of stevedoring efficiency; these results should be carefully studied and put into practice so as to reduce excessive costs in this direction.

Many other factors could be considered in modernizing effectively this great port. However, the factors already reviewed present a promising objective. In working out such principles, it should be borne in mind that the practices of car-floatage and switching should not be disturbed and, above all, every effort should be made to resist any rate change in the New York zone. Furthermore, and this is most important, the entire metropolitan area should be welded firmly together in a determination to preserve port unity—a port unity achieved by striving after the most modern and efficient practices and, above all, having as its guiding principles a complete understanding of the essence of port unity; namely, port equality. This means the development of all parts of the harbor for the most efficient handling of the port's commerce. Then, and only then, will the problem of the Port of New York be solved.

The American Merchant Marine Fleet

Its Employment, Location, Classification, and Ownership

WE present herewith two tables from the Division of Statistics, Bureau of Research, United States Shipping Board, that show the United States merchant fleet disposition and employment as of January 1, 1929.

It is interesting to note that out of a total of 1279 privately owned vessels of 6,451,806 gross tons, only 162, representing 602,584 tons, are laid up; while out of 712 government-owned ships of 3,868,751 tons, 449 ships, representing 2,213,751 tons, are out of use. In other words, only a little over 9 per cent. of the private tonnage is idle, while nearly 60 per cent. of the government tonnage is laid up. Interesting also is the showing that at this particular date over a third of the privately owner idle cargo tonnage of America was located in San Francisco Bay.

Without considering intercoastal lines, the Pacific Coast, in its transpacific, round-the-world, and coast-

Services	Passenger & Combination		General Cargo		Tankers		Total	
	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons
PRIVAFELY OWNED								
*Nearby Foreign	36	159,359	57	178,991	76	526,656	169	865,006
Overseas Foreign	32	346,294	168	929,310	34	212,293	234	1,493,897
Coastwise	89	458,913	408	1,640,586	217	1,390,820	714	3,490,319
Laid up Vessels	29	111,718	106	337,870	27	152,996	162	602,584
Total Privately Owned	156	1,076,284	739	3,086,757	354	2,288,765	1,279	6,451,806
GOVERNMENT OWNED								
Nearby Foreign	**2	19,244	1	4,828	-	-	3	24,072
Overseas Foreign	11	187,871	a245	1,422,551	1	7,045	257	1,617,467
Coastwise	-	-	-	-	1	6,295	1	6,295
Government Service	-	-	2	7,255	-	-	2	7,255
Laid up Vessels	2	37,733	a442	2,144,756	5	31,173	449	2,213,662
Total Government Owned	15	244,849	690	3,579,390	7	44,513	712	3,865,751
Total American Fleet	201	1,321,132	1,429	6,666,147	361	2,333,278	1,991	10,330,557

*Nearby includes, Canada, Mexico, Central America, West Indies and North Coast South America to and including the Guianas.
**Panama R. R. Vessels.
aIncludes 2 Panama R. R. Vessels.

Table showing the ownership and employment of the American merchant marine fleet as of January 1, 1929.

Ports	Private Ownership						Government Ownership						Total	
	Passengers		Cargo		Tankers		Passengers		Cargo		Tankers			
	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons
Baltimore	2	11,818	5	11,320	-	-	-	-	-	-	-	-	7	23,138
Bellingham	3	5,340	-	-	-	-	-	-	-	-	-	-	3	5,340
Beaumont	-	-	-	-	1	3,663	-	-	-	-	-	-	1	3,663
Boston	5	24,280	5	13,271	-	-	-	-	-	-	-	-	10	37,551
Charleston	-	-	-	-	-	-	-	-	3	17,781	-	-	3	17,781
Chester, Pa.	-	-	1	7,590	-	-	-	-	-	-	-	-	1	7,590
Everett	1	1,203	-	-	-	-	-	-	-	-	-	-	1	1,203
Freeport	-	-	-	-	1	4,437	-	-	-	-	-	-	1	4,437
Gatun Lake	-	-	-	-	-	-	-	-	*2	21,991	-	-	2	21,991
Grays Harbor	-	-	1	1,030	-	-	-	-	-	-	-	-	1	1,030
Hongkong	-	-	1	5,645	-	-	-	-	-	-	-	-	1	5,645
Houston	-	-	-	-	1	3,518	-	-	1	6,171	-	-	2	9,689
Jacksonville	-	-	1	1,101	-	-	-	-	-	-	-	-	1	1,101
Mobile	-	-	2	4,683	9	58,027	-	-	10	51,305	3	17,439	24	131,454
New Orleans	-	-	-	-	3	12,098	-	-	18	89,723	-	-	21	101,821
New York	5	13,930	16	48,414	6	37,236	-	-	132	633,195	1	6,373	160	739,148
Newport News	2	21,307	-	-	-	-	-	-	-	-	-	-	2	21,307
Norfolk	-	-	2	4,285	-	-	-	-	213	1,002,971	-	-	215	1,007,256
Orange	-	-	-	-	-	-	-	-	12	42,132	-	-	12	42,132
Paulsboro	-	-	-	-	1	5,372	-	-	-	-	-	-	1	5,372
Philadelphia	-	-	-	-	1	2,397	-	-	49	267,598	-	-	50	269,995
Port Arthur	-	-	1	2,498	1	6,494	-	-	-	-	-	-	2	8,992
Port Newark	-	-	12	40,104	-	-	-	-	-	-	-	-	12	40,104
Portland, Me.	-	-	2	3,132	-	-	-	-	-	-	-	-	2	3,132
Portland, Ore.	-	-	4	12,406	-	-	-	-	-	-	-	-	4	12,406
Providence	-	-	2	5,599	1	1,257	-	-	-	-	-	-	3	6,856
San Francisco	4	15,689	31	116,147	1	11,500	-	-	2	11,688	1	7,311	39	162,335
San Pedro	1	1,057	-	-	-	-	-	-	-	-	-	-	1	1,057
Savannah	-	-	1	2,674	-	-	-	-	-	-	-	-	1	2,674
Seattle	6	17,294	19	58,022	-	-	-	-	-	-	-	-	25	75,316
Solomons Is.	-	-	-	-	-	-	2	37,733	-	-	-	-	2	37,733
Tampico	-	-	-	-	1	6,947	-	-	-	-	-	-	1	6,947
Total	29	111,718	106	337,870	27	152,996	2	37,733	442	2,144,756	5	31,173	611	2,816,246

*Panama R. R. Vessels

Table showing the ownership and location of the laid-up merchant marine fleet of the United States.

wise services absorbs 308 vessels, representing 1,619,313 gross tons. These vessels are all active and represent about 22 per cent of the entire active fleet. Practically all of this fleet is owned outright by private American capital and the small portion of it that remains with the government is in process of being acquired by private operators.

The intercoastal business is credited with 199 vessels, of 1,218,663 gross tons. Thus we have serving Pacific Coast, and largely Pacific Coast owned, a fleet of 507 vessels aggregating 2,837,976 tons, or approximately 38 per cent of the entire active American merchant marine.

An interesting item in the laid-up fleet table is the two passenger vessels, 37,733 gross tons, laid up at Solomon's Island. These are the Mount Vernon and the Monticello.

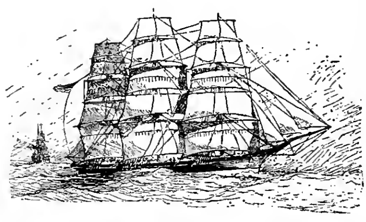
Two Famous American Shipmasters "Cross the Bar"

INFORMATION has been received of the death of Captain Daniel C. Nichols, who passed away on November 27 in a hospital at Belfast, Maine, at the advanced age of 83 years. He had been in the hospital but a few weeks, but had been afflicted with locomotor ataxia for a number of years.

Captain Nichols, a native of Searsport, Maine, and son of an old-time shipbuilder of that town, started sea life at the age of fifteen and at twenty-five was in command of the bark Commodore Du Pont. His next command was the bark Robert Porter, and following this he was in the famous ship Wandering Jew for several years. This fine ship was set afire by her crew and burned at Hong Kong, after which Captain Nichols took the Emily Reed and continued in her until she was sold at Tacoma in 1900. He then had the well-known ship Manuel Llaguna for some five years, and when she was sold he gave up a sea life, settling down in his native town. For several years thereafter he managed a woodworking mill.

Most of the voyages of Captain Nichols were made to the East Indies, China, or Japan. In the Manuel Llaguna he once made the fine run of 88 days from Singapore to Boston. He was a fine specimen of the old time Yankee deep sea captain and was always highly respected.

Another old time master mariner who not long since joined the great majority was Captain William Tobey, Jr., of Thomaston, Maine, who died at the ripe age of 85 years. Captain Tobey was one of the best known masters in the California trade, his first command being the full rigged ship Pactolus, in which he succeeded his father after having been in the ship as chief mate. In 1876 he took the new ship Santa Clara, continuing in her until assuming command of the large ship John McDonald, launched in December 1882. After a few years in this ship, Captain Tobey retired from the sea to engage in business in the Middle West. Some dozen or so years ago he returned home to Thomaston.



Art Modern in Passenger Accommodations

President Johnson, Latest Round-the-World Liner of the Dollar Steamship Company, Features New Style in First-Class Rooms

THE new first-class passenger accommodations on the Dollar liner President Johnson have been attracting a great deal of interest among the marine fraternity of San Francisco, whence this vessel sailed recently on her first voyage in the round-the-world service. The interior decoration, furnishing, and building of these new first-class passenger accommodations constitute one of the outstanding remodeling jobs for American shipyards. The work was done by the Newport News Shipbuilding & Drydock Company in seventy-seven consecutive days, the vessel having been handed over to the plant on November 3, 1928, and redelivered to the owners on January 19, 1929.

During this period all first-class passenger accommodations were removed and 75 new staterooms, providing accommodations for 175 persons, were installed, furnished, and decorated. The public rooms, including the dining saloon, lounge, smoking room, and veranda cafe, were rearranged and rebuilt. A new house was built on the boat deck, enclosing the smoking room and a new veranda cafe, and on the deck on top of this house an absolutely clear space, approximately 40 by 60 feet, was fitted up for play ground.

View through sitting room into bed room of the suite de luxe. French period furniture in walnut, inlaid with rose, apple, and other fine woods. Floor covered with broad loom carpet.

In the rebuilding and rearranging of the staterooms, 25 private baths and toilets were installed. Two new stairways were constructed, the passageways for staterooms were widened considerably, the lobbies enlarged, and a handsome purser's office was fitted up in the modern style with a large counter protected by an iron grille in vertigree finish located on the after side of the main foyer.

It will be readily appreciated by those who are familiar with marine construction that the complete building, furnishing, outfitting, and fire protecting of this number of staterooms and public rooms in the time mentioned is a very creditable performance and illustrates very graphically the capacity of the plant of the Newport News Shipbuilding & Drydock Company and the executive ability of William Bush, of the Dollar Steamship Company, under whose personal supervision the work was accomplished.

Of especial interest to San Franciscans and Pacific Coast maritime circles is the fact that the interior decoration and furnishings of all of these rooms were planned and largely executed in San Francisco and shipped back to the yard at Newport News for installation in the ship. The contract for the entire interior decoration job was let to A. F. Marten & Company of San Francisco, a firm that has for some time been closely affiliated with

Above. Veranda cafe, featuring specially lacquered design in peel chairs, cinnamon lacquered tables, walnut parquet floor, and green and gold damask drapes. Electric fixtures in this room are of a very attractive design in French gold and cathedral glass.

At the left is shown the bed room of the suite de luxe.

Interior view of Social Hall, S.S. President Johnson of the Dollar Steamship Line
Designed and executed by A. F. Marten Co., San Francisco

the work of enlarging and refurnishing the first-class passenger accommodations of the ships of the Dollar fleet.

The passenger accommodation plans reproduced herewith show the new arrangements of first-class staterooms and public rooms. It will be noted that the rooms on the promenade deck have communicating baths, with the exception of one large room aft, which has its individual bath. Baths on this deck are all showers and are wainscoted shoulder high in green tile with an inlaid colored border and have paneled ceiling enameled in a delicate shade of orchid, the floor being in small white and cream ceramic tiles; the combination making a very attractive and unusual bath interior for shipboard.

On A deck the staterooms all have communicating baths furnished with tubs and showers. Finish on bulkheads, ceiling, and floor is in the same attractive tile and paint color scheme as described for the shower baths on the promenade deck.

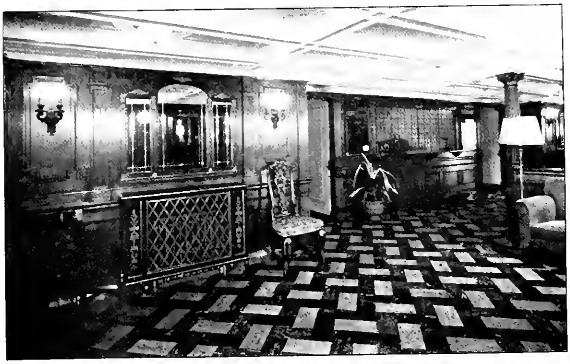
A very handsome suite, consisting of living room, bed room, and bath, is located on the starboard side of A deck just aft of the dining saloon. This suite is exquisitely decorated and furnished in French period.

Staterooms on B deck are arranged on the starboard side only. A stairway leads down from the lobby abaft the dining room on A deck to a large, tastefully decorated and furnished lobby at the forward end of this tier of first-class rooms on Deck B. On both A and B decks ample provision of public baths, toilets, and lavatories is arranged. Toilets throughout are fitted with the Victory Flushometer, manufactured by the Handy Flush Valve Company of San Francisco.

All staterooms have hot and cold running water and porcelain lavatories. All plumbing fittings were furnished by the Standard Sanitary Manufacturing Company. Each room is equipped with a bracket fan furnished by the Diehl Manufacturing Company.

Each passenger is assured of comfortable repose, as every room is furnished with two 36-inch by 6-feet 6-inch Simmons metal bedsteads equipped with Simmons Beautyrest mattresses. In addition, the furniture of the standard first-class stateroom includes a broad settee equipped with wire spring mattress and with special cushions. This settee arrangement makes a very nice day bed or can be used for sleeping accommodation for an extra passenger. Each settee is of ample size to make a very comfortable bed. Two large drawers under each settee furnish convenient storage space.

All rooms have two chiffoniers and one or more wardrobe closets. All of the rooms are outside rooms and, with very few exceptions, each of them has two windows or ports. The rooms are finished in a simple, attractive style with paneled plyboard walls in cream or light pastel shades, the floors being attractively carpeted and the walls being relieved with framed etchings and French colored prints. A very attractive bed light fixture, designed especially for this ship, is mounted on the bulkhead at the head of each bed. The reflector shade on the lamp is a beautifully modeled gilded bronze shell.



Above, the main entrance lobby and purser's office. Note the attractive radiator cover, the unusual and effective design of the floor covering of Goodyear rubber tile, and the wall wainscoting in beautifully paneled English oak.

At the left is shown a corner of the first-class lounge featuring the carpet of special design and weave in two-tone artichoke and gold; furniture in walnut and gold leaf, with coverings of damask, velvet, and frieze in shades of green and flame. This room is decorated in Directoire motif, walls in cafe au lait, and the drapes in flesh-colored damask. Note the mural decorations in pastel shades on the panel at the left. A larger view of this room is shown on the facing page.

The passageways on each deck are wide, well lighted, and well ventilated. An innovation is introduced in way of deck covering in these passageways. Asbestolith in an attractive green shade is trowled onto the deck, tooled in diamond shapes, and the diamonds outlined with a black stripe. This color scheme in connection with a black border running up to the usual cove corner makes a very pleasing and attractive floor, easy to look at and walk upon.

Public Rooms

On the boat deck, the new veranda cafe is decorated in art modern motif. The interior walls of this room are of Vehisote, laid up with flush joints so as to give the effect of plain plaster with no panels. Because of its homogeneous structure and freedom from cracking, warping, or splitting, Vehisote trims to a perfectly fitting edge and is especially adapted for flush joint work. The window frames are arranged with inside boxed effect so that the hangers for the drapes are concealed in the fixtures. A fine walnut parquet floor is installed for dancing. This floor, furnished by the Indiana Floor Company, is said to contain over 9000 pieces. Steam radiators are recessed in the walls behind ornamental brass grilles. The color scheme is light pumpkin, and the room is furnished with red and white lacquered peel chairs, cinnamon lacquered tables, and a piano hand-painted with futuristic designs. The whole make a very colorful and attractive interior.

Just forward of the veranda cafe and communicating with it is the smoking room finished in natural oak paneling and furnished with walnut tables, green Morocco leather chairs, and colorful drapes.

Social Hall

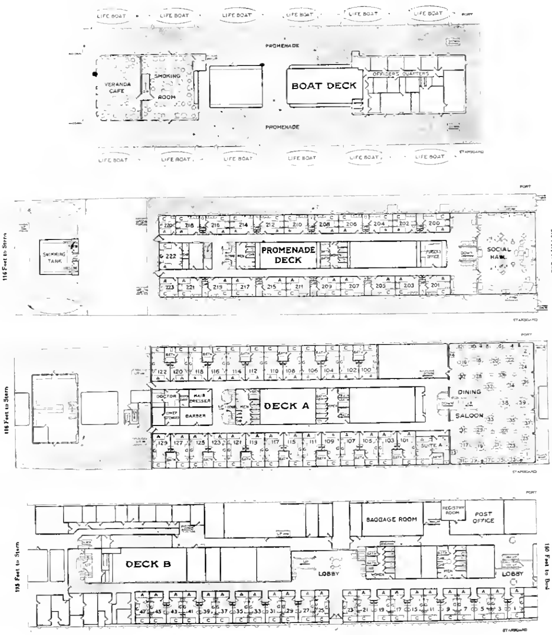
Decorations of the social hall on the promenade deck are carried out in a distinctive Directoire style. Carved casings extending the full height of the room have been installed around each port light, and draped to give effect of long French windows. The Vehisote paneling on the side walls is relieved by fine mural decorations, and the central dome is beautifully decorated with mural paintings in soft pastel shades illuminated by indirect lighting. Fine flesh colored damask hangings and a luxurious carpet in soft green shades produce a very delightful color scheme for this smart salon. The carpet in this room was designed and woven to order especially for this ship. All steam radiators for heating this room are enclosed in very handsomely designed console tables, supporting attractive ornamental brass grilles concealing the radiators.

Abaft of the first-class lounge on the promenade deck is the main foyer. This space has been considerably enlarged and refinished in natural oak paneling and an attractive Goodyear rubber tile floor. Several convenient writing desks for passenger use are provided in this foyer and in the lounge. On the after side of the foyer, and harmoniously worked into the design of the oak paneling, is the large open grilled window to the purser's office. For the convenience of passengers, there has been added to the equipment of the purser's office a block of heavy steel safe deposit boxes for individual deposit of valuables.

An attractive stairway leads down from this foyer to the after end of the first-class dining room. This dining room has been rearranged and provided with thirty-eight small tables to accommodate 172 persons at one sitting. The floor has a harmonious green and brick Goodyear rubber tile covering. Walls and ceiling are finished in light pastel shades, giving an impression of greater height to the large room. The first-class pantry is on this deck immediately abaft the dining room on the port side. This pantry has been completely renewed and re-equipped with steam tables and a number of short order devices, such as waffle irons, egg boilers, and toasters. The first-class galley and bakery are located on the deck below, just under the pantry. This space also has been rearranged and re-equipped with new oil-burning ranges and ovens.

Swimming Pool

A new feature that will add greatly to the enjoyment of the passengers, particularly in the tropics, is a swimming pool, built on the top of the after deckhouse. This pool is a steel tank with a permanent railed deck installed



Arrangement plans of the new first-class passenger accommodations on the Dollar liner President Johnson

At the left, the smoking room, with walls in slash grain old English oak; electric fixtures in vertigree antique brass; and furniture in walnut covered with green Morocco leather—a very attractive typical man's retreat.

Below, the dining saloon, with walls in flesh color and aqua marine transparent hangings. The floor is covered with an attractive design of Goodyear rubber tiling, and the room is furnished with an assortment of small tables, the total seating at one time 172 persons.

around its upper edge, this deck being covered with white corrugated rubber. At the forward end of this pool, underneath this deck, bath houses are arranged with an accommodation ladder to the pool above. The swimming pool is reached from the after end of the promenade deck by a portable gangway.

A complete Derby system for fire detection protects all the passenger accommodations. Each room has one or more Derby sentinels wired to a Derby cabinet in the pilot house through special Derby wiring lay-out, with power from a storage battery. This system was designed and supplied by Walter Kidde & Company, Inc., through Hough & Egbert, Inc., San Francisco representatives.

Steamship President Johnson is a splendid sea boat, 615 feet 8 inches in length with a gross tonnage of 14,328 and a sea speed of 18 knots. Her first round-the-world voyage is booked fairly well up to capacity, and it is predicted for her that she will prove a very popular ship on this service.

United Dry Docks, Incorporated

AT the close of the business day on Thursday, February 28, six of the principal ship repair companies of the Port of New York were brought under unified management when the United Dry Docks, Incorporated, took formal possession of their properties.

The plants involved were those of the Morse Dry Dock & Repair Co., James Shewan & Sons, Inc., Staten Island Shipbuilding Company, W. & A. Fletcher Co., New York Harbor Dry Dock Co., Inc., and the Theodore Crane's Sons Company. The properties acquired comprise a total of twenty-seven dry docks, located at the most accessible points around New York Harbor—and have a combined lifting capacity of 160,000 tons. These yards handle an aggregate upwards of 7,000,000 tons annually.

Edward P. Morse, the veteran shipbuilder who heads the Morse Dry Dock & Repair Co., is president of the new corporation, and George H. Bates, of the Staten Island Shipbuilding Company is associated in the management. Both are men of long experience and of recognized ability in the ship repair business, and will have the support of a strong board of directors, consisting of Joseph W. Powell of Boston, war-time head of the Bethlehem Shipbuilding interests, former president of the Merchants Fleet Corporation, and ex-Naval Constructor; Edward P. Farley, ex-chairman of the United States Shipping Board, president of Edward P. Farley & Company, and chairman of executive committee, American-Hawaiian Steamship Company; Hubert E. Rogers, New York attorney, director of AGWI Steamship Co., and many other corporations; J. E. Aldred, Aldred & Co.; Murray W. Dodge, Chase Securities Corporation; Richard F. Hoyt, Hayden, Stone & Co. and AGWI Steamship Co.; and E. P. Morse, president of the corporation.

Trade, Traffic, and Shipping

Shall the American Coastwise Laws be Extended to the Philippine Islands?

By James H. MacLafferty*

IT is believed by many who are interested in the welfare of American merchant shipping that making the commerce between the United States and the Philippines a protected trade, in which none but American flag vessels may engage, would be one of the most valuable aids that could be administered, and that this extension of American coastwise laws would be of great value to both the United States and the Philippines. The question for consideration is, therefore, "Shall Section 21 of the Merchant Marine Act. 1920, be faithfully enforced, and the coastwise policy of the United States extended to the Philippine Islands, as it has been in succession to Alaska, Hawaii, and Porto Rico?"

This proposed extension of the American coastwise laws is by no means a new idea. It probably would have been undertaken in 1914 but for the outbreak of the world war and its grave effects on the world's shipping. We all know it has been for many years deemed an advisable thing to do. So prevalent was this opinion that about nine years ago its advisability was determined by Congress and authorization for it was enacted into law in the Merchant Marine Act of 1920.

In order that this authorization may be clearly in our minds at this time I shall quote Section 21 of the act just mentioned:

> Sec. 21. That from and after February 1, 1922, the coastwise laws of the United States shall extend to the island territories and possessions of the United States not now covered thereby, and the board is directed prior to the expiration of such year (time) to have established adequate steamship service at reasonable rates to accommodate the commerce and the passenger travel of said islands and to maintain and operate such service until it can be taken over and operated and maintained upon satisfactory terms by private capital and enterprise: PROVIDED, that if adequate shipping service is not established by February 1, 1922, the President shall extend the period herein allowed for the establishment of such service in the case of any island territory or possession for such time as may be necessary for the establishment of adequate shipping facilities therefor: PROVIDED FURTHER, That until Congress shall have authorized the registry as vessels of the United States of vessels owned in the Philippine Islands, the Government of the Philippine Islands is hereby authorized to adopt, from time to time, and enforce regulations governing the transportation of merchandise and passengers between ports or places in the Philippine Archipelago: AND PROVIDED FURTHER, That the foregoing provisions of this section shall not take effect with reference to the Philippine Islands until the President of the United States after a full investigation of the local needs and conditions shall, by proclamation, declare that an adequate shipping service has been established as herein provided and fix a date for the going into effect of the same.

It will be noted that the last proviso of the section just read authorizes the President of the United States after a full investigation concerning local needs and conditions to declare by proclamation that adequate shipping facilities exist and that he shall fix the date for the extension of the American coastwise laws to the Philippine Islands.

It is probably a fair statement to say that the belief is general and well grounded, among those who are eminently qualified to know, that there is now sufficient American flag tonnage to handle all trade between the United States and the Philippines to the advantage of both countries in addition to all other transportation needs.

Shipping Board Certifies Tonnage.

It is stated in the Twelfth Annual Report of the United States Shipping Board for the fiscal year ended June 30, 1928, that there was a recommendation by resolution to the President of the United States, dated January 30, 1922, certifying the adequacy of tonnage available for service in commerce between the United States and the Philippine Islands. We quote here the resolution:

> Whereas, in the opinion of the United States Shipping Board, adequate steamship service at reasonable rates to accommodate the commerce and the passenger travel of the Philippine Islands has been established, be it
>
> Resolved, that certification be made to the President of the United States that such adequate service as set forth above does exist, and that in the opinion of the United States Shipping Board the provision of Section 21 of the Merchant Marine Act of 1920, extending the coastwise laws of the United States to the Philippine Islands, should now be carried into effect in the manner specified therein.

This resolution is still in force, but no proclamation has ever been issued by the President declaring that adequate shipping service exists and fixing a date for the coastwise laws to become effective with the Philippine Islands; hence foreign-flag vessels share in the commerce between the Philippine Islands and the United States.

The Bureau of Traffic of the Shipping Board has investigated and is continuing investigations bearing on conditions relating to the Philippine Islands to the end that at the proper time further representations may be made to the President relative to the matter. That they will find ample justification for being even more emphatic in further representations to the President is almost a foregone conclusion.

We are, after all, probably the second maritime nation in the world for the reason that we have in protecting our coastwise trade from foreign flag ships developed a fleet of American-built ships, now engaged on the Atlantic and Pacific Coasts and on the Great Lakes and the Gulf, said to be greater in tonnage than the combined coastwise fleets of the great maritime nations of the world.

*From paper read at Second National Conference on Merchant Marine, Washington, D.C., January 23, 1929.

Present Tonnage Engaged.

Analysis of the trade between continental United States and the Philippine Islands during the fiscal year ended June 30, 1928, shows that 127 vessels of 898,035 gross tons and 1,258,697 deadweight tonnage participated in the trade which consisted of the movement to and from the Philippines of approximately 1,500,000 tons of cargo. This total was made up of about 900,000 tons of imports from the Philippines and 600,000 tons of exports to the Philippines.

Under existing trade route arrangements, all traffic between continental United States and the Philippines may be termed "way movement," as none of the services engaged in this trade have terminals in the Philippines. The lines taking part in the Philippine trade call at Philippine ports en route between continental United States and Australia, East India, or oriental ports; but none of them conduct trade directly between the United States and the Philippines and return.

The import movement is approximately 50 percent greater than the export movement owing to heavy imports of sugar, copra, and cocoanut oil. The heaviest sugar import occurs in February, March, April, May, and June when the import total approximates 100,000 cargo tons per month. During the remaining seven months of the year the import movement approximates 60,000 tons per month, the extremes of variation being 49,000 tons and 70,000 tons. The export movement is more regular and averages about 50,000 tons per month. Records of the export trade of the fiscal year 1928 show only two months with exports of less than 40,000 tons and only one month in which the export cargo tonnage exceeded 60,000 tons.

The 68 American vessels taking part in the Philippine trade in 1928 had a combined carrying capacity of approximately 575,000 cargo tons, or nearly sufficient, if employed exclusively in the Philippine trade, to carry the entire export movement of 1928 in one voyage. Assuming an average of three round voyages per annum this fleet could carry more than 1,700,000 cargo tons each way and a total of combined imports and exports of about 3,500,000 tons annually, or more than double the entire Philippine trade in 1928.

It would appear, therefore, that the present American flag fleet is more than ample to handle the transportation requirements of the Philippine trade. Its adaptation to that trade, however, would require certain changes in service routings, for, as above mentioned, the Philippine calls as now made by American vessels are incidental to through services to other localities.

Any arrangement of trade routes designed to handle the Philippine trade must provide for the inequality of imports of approximately 50 percent in excess of the exports. However, as our present export trade with the orient, including the Philippines, is more than four times the volume of the import trade from that region, it should be feasible to establish services including ports of call in the orient absorbing sufficient tonnage of exports to balance the trade.

In addition to the fleet of 68 American vessels now engaged in this trade there are upwards of 100 ships of 8800 deadweight tons and over now engaged in our protected domestic trades which could be employed in the Philippine trade.

In the Tariff Act of 1909, Philippine products were given free entry to American ports, but with some limitations. However, in the tariff Act of 1913 free entry of Philippine products was made complete and unconditional. A situation was then established which made wholly logical the application of the coastwise law to our Philippine commerce. Therefore, it was manifestly fair, just, and in accord with the unbroken historical policy of the United States, that the coastwise law should be applied to this Philippine commerce. And it is obvious that if the Philippine Islands enjoy the benefits of our high protective tariff, it is only just and proper that the coastwise laws should apply as in the case of any other possession of the United States, especially when it is further understood that it has cost our government many millions of dollars for the maintenance of stable government in the Islands.

If the extension of the coastwise laws to the Philippines is justified by the present amount of commerce between the two countries, it may also be remembered that the commerce of the future will be of vastly greater moment. To realize this statement one need but review the growth of this trade since 1899. Perhaps no better authority as to this can be quoted than to refer to a statement made by Major-General Frank McIntyre, Chief of the Bureau of Insular Affairs. This complete statement is an article published in the Commerce Reports and is very illuminating. We shall here quote only in part.

General McIntyre points out that the total Philippine trade with countries other than the United States in 1927 amounted to $84,000,000 as against $84,600,000 for 1926, thus registering a slight falling off which, on the other hand, was more than compensated by an increase in trade with the United States from $171,600,000 in 1926 to $187,500,000 in 1927. Philippine trade with the United States amounted to only $4,650,000 in 1899. Imports from the United States in 1899 were valued at $1,150,000; in 1927, at $71,000,000. Philippine exports to the United States in 1899 were about $3,500,000. In 1927 this trade was valued at $116,040,000. General McIntyre goes on to say that in a comparison of Philippine commercial development over the period from 1899 to 1927, with the advance made in foreign trade of the United States during the same years, it will be seen that the United States total exports in 1927 were about four times larger than in 1899, while the export trade of the Philippine Islands was about ten times greater, and that imports into the United States in 1927 were approximately six times those of 1899, while the value of Philippine imports was practically nine times that of the earlier year.

It would seem, in view of all this, that the United States is thoroughly justified in using every particle of its own resources for the purpose of building up its merchant marine. There may be some difference of opinion as to just what extent the government should or can go in the way of monetary aid, but surely there can be no valid argument against the justice and utter good sense of the American people using as obvious a means as the extension of the coastwise laws to the Philippines for the purpose of saving themselves from failure in competition on the sea with the great maritime nations of the world. It is not necessary, in discussing this subject at this time, to prove the necessity. That is known to all; but it is perhaps necessary to emphasize it in no uncertain manner and to secure its adoption as a means toward a highly desirable end.

In addition to this statement by the Shipping Board, it should be mentioned that the extension of American coastwise laws to the Philippines has the endorsement of three of the large shipowners' associations of our country.

There is precedent for the extension of our coastwise laws to the Philippines by our action in having already

extended these laws to Hawaii. It is fair, it is right, it is just, and it is very necessary that it should be done. Our British friends see to it that practically all the trade among British possessions is carried under the British flag, and they must marvel at the lack of American foresight in our willingly consenting to a division of the Philippine-American trade with other maritime nations. The putting into effect of an extension of our coastwise laws will work a miracle of change on the Pacific as regards our merchant marine, and will stimulate activity beneficial in the extreme to the advancement of American commerce. It will furthermore be an evidence to the world that the American people are alive to the determination to protect their coastwise laws. It is the dream of the maritime nations that some day these laws will be modified in their favor and repeated assaults have been made upon them with poor success. America realizes that if they ever are broken down there will be no American merchant marine.

In a pamphlet issued in May, 1925, entitled, "Recommendations of American Steamship Owners' Association, and Pacific American Steamship Association, and Shipowners' Association of the Pacific Coast," the associations unqualifiedly endorsed the extension of our coastwise laws. Let us here quote the language used:

The Associations believe that the extension of the coastwise laws of the United States to trades with the Philippines and other island possessions, as provided for in Section 21 of the Merchant Marine Act, 1920, would be of great assistance in the upbuilding and maintenance of a successful merchant marine. The Associations appreciate that political as well as business considerations are involved in an extension of these laws, but they believe that if there is not now in operation an adequate service by American flag ships properly to care for all present and future trade with the Philippines and other island possessions, such service can and will be readily established as soon as a definite date is set for the application of the coastwise laws to such trades.

The Associations indulge in the hope that the considerations which have led the President of the United States to question the advisability of enforcing the provisions of Section 21 can be obviated so that American shipping may have the exclusive benefit of trades which rightfully belong to the United States.

Accordingly, the Associations recommend:

(20) That representation be made to the President of the United States of the desirability of fixing a date for the going into effect of the coastwise laws of the United States with reference to the Philippine Islands and other island possessions of the United States, as soon as the President deems it expedient.

In the light of the endorsements already cited and remembering that the sentiment throughout the country favorable to extension of our coastwise laws was such as to justify enactment by Congress of Section 21 of the Merchant Marine Act of 1920, it would almost

(Continued on Page 23, Blue Form)

COMMERCE OF CONTINENTAL UNITED STATES WITH PHILIPPINE ISLANDS
FISCAL YEAR ENDED JUNE 30, 1928
TABLE I - CARGO TONNAGE SEGREGATED BY FLAGS OF CARRIERS
TABLE II - VESSELS EMPLOYED SEGREGATED BY FLAGS
(Cargo in Tons of 2,240 Pounds)

TABLE I - Cargo Tonnage

	TOTAL		IMPORTS		EXPORTS	
Flags of Carriers	Tons	Percentage of Total	Tons	Percentage of Total	Tons	Percentage of Total
United States	913,727	60.5	536,112	58.3	377,615	64.0
Great Britain	414,243	27.5	221,803	24.1	192,440	32.6
Japan	104,752	6.9	104,752	11.4	-	-
Norway	45,045	2.9	22,900	2.5	20,145	3.4
Sweden	28,919	1.9	28,919	3.1	-	-
Netherlands	5,062	.3	5,062	.6	-	-
Total	1,509,748		919,548		590,200	

TABLE II - Vessels Employed

Flags of Carriers	Number of Vessels	Percentage of Total	Gross Tonnage	Percentage of Total	Deadweight Tonnage	Percentage of Total
United States	68	53.5	547,220	61.0	718,372	57.1
Great Britain	44	34.6	259,430	28.9	399,078	31.7
Japan	6	4.7	42,485	4.7	64,529	5.1
*Norway	3	2.4	13,765	1.5	21,150	1.7
*Sweden	4	3.2	21,438	2.4	34,560	2.7
Netherlands	2	1.6	13,701	1.5	21,008	1.7
Total	127		898,035		1,258,697	

*Tramp voyages occurring during fiscal year 1928; no established service by this flag in this trade.
(All figures subject to revision.)

IMPORTS

Grain (Other than Wheat, Corn & Barley	86
Vegetable Oils	110,357
Vegetables & Vegetable Products, n.e.s.	13,721
Animal, Fish & Dairy Products	91
Coconuts & Copra	162,286
Other Fruits & Nuts	2
Sugar	523,874
Coffee	24
Tobacco	4,165
Cotton Mfrs.	368
Silk Mfrs.	15
Jute Mfrs.	100
Other Vegetable Fibers & Grasses	44,246
Textiles & Mfrs., n.e.s.	1,791
Rubber	431
Coal & Coke	307
Petroleum & Products	906
Iron, Steel & Mfrs.	45
Misc. Metals & Mfrs.	111
Logs & Lumber	52,973
Pigments, Chemicals & Mfrs.	70
All Others	5,619
TOTAL	919,548

EXPORTS

Corn	1,721
Barley	10
Oats	213
Other Grains	2,562
Wheat Flour	67,714
Vegetables & Vegetable Products, n.e.s.	4,859
Animal, Fish & Dairy Products	24,290
Fruits and Nuts	4,945
Sugar	349
Naval Stores	377
Tobacco & Mfrs.	3,392
Cotton	610
Cotton Mfrs.	8,289
Other Textiles & Mfrs.	388
Hides, Skins & Mfrs.	238
Rubber & Mfrs.	1,684
Paper Stock & Mfrs.	12,577
Coal & Coke	18,587
Petroleum & Products	229,475
Sulphur	97
Cement	282
Non-metallic Minerals & Mfrs., n.e.s.	6,753
Iron Ores	25
Iron, Steel & Mfrs.	86,025
Machinery	12,695
Vehicles	13,080
Copper & Mfrs.	424
Ores, Metals & Mfrs.	351
Logs & Lumber	9,623
Phosphates	565
Other Fertilizers	16,800
Pigments, Chemicals & Mfrs.	17,597
All Others	43,625
TOTAL	590,210

Tonnage of imports and exports between continental United States and the Philippine Islands for the fiscal year 1928, segregated into principal commodities.

Improved Performance of Geared Turbine Drive

Some Notes on the Performance of the DeLaval Geared Turbines on the Morgan Liner Dixie and Some Suggestions for Obtaining even better Fuel Economy

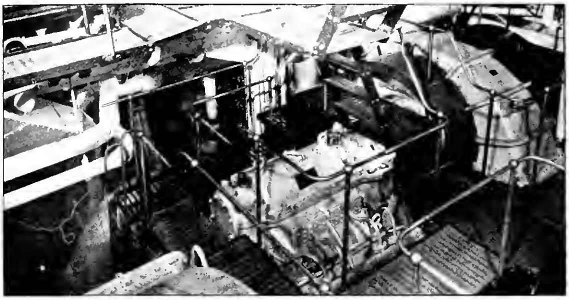
IN a recent paper, C. R. Waller, chief engineer of the De Laval Steam Turbine Company, points out the fact that the steam turbine drive is gaining in favor, especially for medium and large powers. He gives some very interesting figures from the test data of the Morgan liner Dixie and shows how a ship of the same type, built today, could have a much better fuel consumption rate. We present herewith some extracts from this paper:

In general, recent improvements in equipment put steam on a new footing. These innovations include higher steam pressure, higher superheat, higher vacuum, and the regenerative heating of feed water by means of steam withdrawn from successive stages of the turbine. By virtue of these improvements, a shaft horsepower can be developed on a total fuel consumption for all purposes, including auxiliaries, of 0.6 to 0.65 pound of oil, or less than one pound of coal, and even better figures may be expected. Besides requiring less expenditure for fuel, the steam turbine power plant, particularly with mechanical reduction gear, weighs less and, in the larger powers, occupies less space than does any other well proved type of marine prime mover.

Particular reference to the Dixie shows that this vessel has the following dimensions: Length over-all 445 feet; length between perpendiculars 427 feet; beam 60 feet; draft 26 feet; and gross tonnage 8188.

She is fitted with a De Laval compound turbine with double reduction gears designed to develop 7100 normal shaft horsepower (with 10 percent maximum overload capacity) at 90 revolutions per minute propeller speed, and is capable of a speed of 16 knots per hour. The turbine is designed to receive steam from Babcock & Wilcox boilers at 330 pounds, gauge and 200 degrees F. superheat. Air heaters recover heat from the stack gases.

The auxiliaries are steam driven, including two generator sets supplying current for lighting and cooking, the exhaust of which is used for heating feed water, for heating the vessel, and for hot water service to all staterooms. The cargo capacity is 5125 long tons, or 414,055 cubic feet (6000 cubic feet of which is baggage space), the machinery occuping a space of 71½ feet fore and aft.



Looking down from the middle grating of the engine room of the steamship Dixie at the port side, showing low pressure turbine and its first reduction gear.

The official trial of the Dixie was conducted during voyage No. 2 and the following data were taken from the official log covering this trial run.

Four boilers were used most of the time; but on a number of occasions, for periods of about 24 hours each, one boiler was cut out and the ship run on three. At the higher rate of driving, the temperatures in uptakes and air heater boxes were raised, resulting in 0.6 per cent lower boiler efficiency, but increasing the superheat so that the turbine efficiency was improved about 3 per cent. The auxiliaries were operated on boiler steam at reduced pressure, exhausting under back pressure to the heating system, feed water heater, and the low pressure section of the main turbine, except during certain periods of the southbound and northbound trips, when the exhaust of all auxiliaries was led into the auxiliary condenser in order to determine the water rate of the main turbine without auxiliaries. Otherwise, the methods of operation were normal.

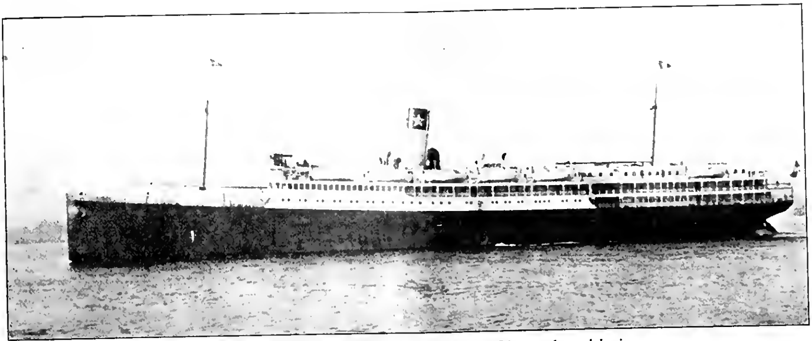
The builder's trial trip covered a complete round trip from New York to New Orleans and back to New York, and the following are averages of the readings taken during this trial trip:

	South Bound	North Bound.
Mean displacement, tons	10,220	11,830
Mean draft	22'1½"	24' 11¼"
Distance run, miles	1607	1609
Time elapsed	105 hr. 39 min.	95 hr. 40 min.
Mean speed, knots	15.17	16.81
Mean r.p.m.	90.35	90.28
Mean shaft horsepower	7600	7535
Mean fuel consumption, lb. oil per S.H.P.	0.783	0.7975
Heat content of oil, BTU per lb.	18,190	18,010
Mean steam pressure, lbs.	335.5	332.2
Mean steam temp. at turbine, °F.	602.7	603.6
Mean vacuum, corrected, ins.	28.18	28.44
Back pressure on auxiliaries, lbs.	12.9	14.54
Mean auxiliary generator load, kw.	64.9	61.1

During the southbound trip a six-hour fuel and water rate test was run at 14.4 knots. The fuel consumption was determined by tank soundings as well as by meter readings, and the steam used by all of the auxiliaries was condensed in the auxiliary condenser and measured. The over-all fuel rate per shaft horsepower was 0.764 pound, the auxiliaries using 25 per cent. of the total steam, as determined by measurement. In a similar twelve-hour test on the northbound trip, the following values were obtained:

Speed—16.71 knots.

Over-all oil consumption—0.780 lb. per S.H.P.



The Atlantic coastwise liner Dixie of the Morgan Line on her trial trip.

Steam used by auxiliaries—25.05 per cent.

Four boilers were in use during these several tests, the superheat ranging from 170.8 deg. Fahrenheit to 178.2 deg. Fahrenheit, as against the designed value of 200 deg. Fahrenheit, and the pressure at the boilers varied from 344 to 344.1 pounds as against the designed value of 350 pounds; while the corrected vacuum was almost exactly 28 inches as against the designed value of 28.5 inches.

Improvement in fuel consumption of this plant could be made by driving all auxiliaries with electric power from a generator driven off the main turbine shaft and heating feed water with steam bled from the turbine stages. These improvements with power plant otherwise unchanged figure to give the Dixie a fuel consumption rate of 0.66 pound of fuel oil per shaft horsepower for all purposes.

The power plant of a new vessel designed along the lines of the Dixie could be still further improved. For instance, modern high efficiency water-tube boilers would have an efficiency of about 85 per cent, including air heaters or economizers, while high efficiency, cross compound turbines with double reduction gears receiving steam at 400 pounds gauge and at 725 deg. Fahrenheit, and exhausting to 28½ inch vacuum would have a practically flat efficiency curve of about 75 percent over the working range, giving a fuel consumption of about 0.6 pound of oil per shaft horsepower for all purposes. The generator supplying power to electric driven auxiliaries would normally be coupled directly to the main turbine, but would also be arranged to be driven by a stand-by turbine or internal combustion motor for use when the main turbine was turning at slow speed, or shut down altogether, as at dock. The motor-driven condenser circulating pumps could be arranged to draw from the hold in case of necessity, supplementing the bilge pumps.

The recorded operating results of the Dixie for the first eight round trips between New York and New Orleans are given in the table reproduced herewith. It will be noted that the mean speeds made on individual trips to suit the running schedule vary from 12.1 knots to 16.7 knots, 16 knots being the designed speed, and are thus within the range of high turbine efficiency, even though the speed of the turbine does bear a fixed ratio to the speed of the ship.

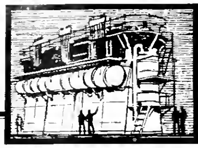
Series No. 2 on **Shipping Charges at United States and Foreign Ports.** This volume gives information relative to consular services and charges affecting vessels, freight, and passengers moving between the ports of the United States and foreign ports. In addition, the report contains data with respect to monetary systems and current exchange rates needed to reduce certain of the charges to their equivalents in United States currency, and also information respecting passports and passport visas.

Copies obtainable from the Superintendent of Documents, Government Printing Office, Washington, D.C., price 25 cents.

Voy. No.	R. P. M. South bound	R. P. M. North bound	SPEED (Knots) South bound	SPEED (Knots) North bound	Fuel Oil Gals. South	Be°.	Fuel Oil Gals. North	°Be.	** Mean Draft	*** Mean Dplt. Tons	Lbs. Oil SB + NB	Time Hrs.
1	75.3	79.7	13.0	14.8	61300	13.72	60790	13.45	22-6-5/8	10475	991500	247.12
*2	90.5	90.3	14.8	16.7	87500	13.45	79220	13.52	23-0½	10750	1356000	218.12
3	74.3	79.0	12.3	15.0	59600	13.52	57500	16.18	23-0½	10750	943000	253.6
4	76.0	75.5	12.4	14.9	59400	16.18	52500	16.45	21-8-3/8	10000	893000	253.55
5	72.7	79.6	12.4	15.0	53300	16.45	58700	16.85	22-6½	10460	921000	249.33
6	71.9	77.9	12.1	15.1	53000	16.85	55300	16.30	22-5-3/8	10400	862000	254.28
7	70.7	82.2	12.2	15.3	53000	16.30	60500	15.48	22-9-3/4	10620	808000	254.25
8	71.0	78.0	12.3	14.9	55000	15.48	56000	13.25	22-5-3/4	10420	897000	253.07

*Trial Trip.
**Full load draft, 26 ft. 0 ins.
***Full load displacement, 12440 tons.

Table showing performance of the Dixie's propulsion plant on eight round voyages between New York and New Orleans.



In the Engine Room

Mechanics for Marine Engineers

Part VI: Stresses on Slings, Booms and Masts

By A. L. Becker.

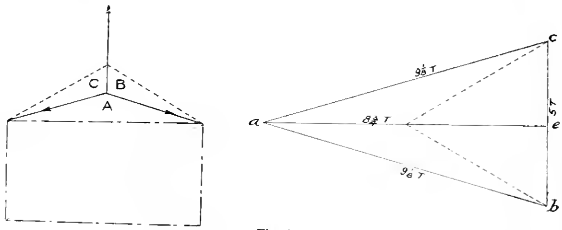


Fig. 7.

GRAPHICAL analysis of stress diagrams is a very handy way of figuring stress on slings, and is illustrated by the following typical problem:

In Fig. 7 the sketch may represent a weight lifted by a line B.C. through a sling about the weight terminating at the point A. The sketch may also represent the lift on a cylinder cover, the towing of a barge by the tow line attached to a bridle, or many other similar applications.

Assume in the first illustration the weight to be lifted is 5 tons, and that the cable B.C. has a sufficient margin of safety to carry the load as determined from a table of safe working stresses allowable for the size of cable used.

Beginning at the point b in the stress diagram, draw the line b.c. in the direction the force acts parallel to B.C. of the sketch, and make the length of b.c. 5 tons to any convenient scale. From c, draw a line c.a. parallel to C.A. and of such a length that a line drawn from a, drawn parallel to A.B., will land on b. The length of the line c.a.=a.b. will when measured to the same scale show the stress in the sling (approximately 9 1/8 tons). It is evident that the sling, if made of a single part of the same cable as used in the hoist, would not have the same safety factor. If the sling were doubled, the hitch would be safe.

Further: If on the stress diagram the dotted triangle be drawn making all sides equal and the new position be indicated on the sketch, it will be noted that to equalize the stresses in the sling and fall, the sling should be lengthened as indicated by dotted line in the sketch. The stresses are all equal when the angles at A.B. and C. are equal (120 degrees).

The horizontal projection of this stress in the sling is represented by the line a.e. or 8¾ tons, as drawn. in lifting a cylinder cover, the length of line a.e. shows the compressive stress on the strut between the eye bolts.

By the same kind of practical common sense analysis we may apply the stress diagram to derricks, ship's booms, masts, and other structural members in compression or tension.

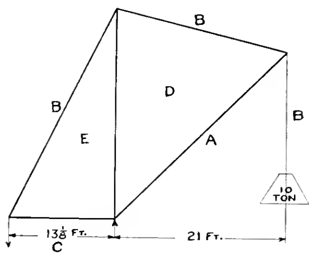


Fig 8

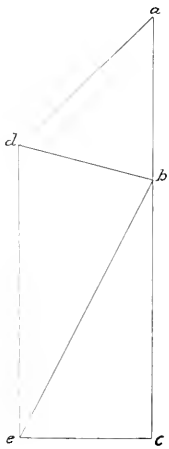


Fig. 8 may represent a derrick, drawn to scale, with a load of 10 tons overhanging the foot of the mast 21 feet. The back guy attachment is 13 1/8 ft. from the base of the mast. The problem is to find the stress in all members. By taking moments about the base of the mast:

10 x 21 ft.= +210 foot tons to produce clockwise rotation.

16 x 13 1/8 ft.= —210 foot tons to produce anti-clockwise rotation.

Therefore the vertical load necessary to hold down the back guy is 16 tons.

As the sum of the vertical forces must be zero, the reaction under the mast must be minus (16+10) tons, or 26 tons.

Consider the point of the boom.

Starting with a. in the stress diagram, lay off a.b. by scale to equal 10 tons, drawing the line from a. to b. in the direction the force acts, and parallel to A.B. From b. draw a line parallel to D.B. until a line from d. parallel to D.A. will end at a. The lines b.d. and d.a. can now be measured to obtain the stresses in the toppling lift and in the boom.

Next consider the top of mast as the second point of meeting of forces. Starting with the topping lift D.B., the stress in this part was found from a consideration of the first point; therefore, beginning at d, in the stress diagram to the point b, from b draw a line parallel to B.E. to a point where a line from e drawn parallel to E.D. will reach the point d. The length of the lines b.e. and e.d. to the same scale will give the stress in the back guy and in the mast. Consider the third point where the back guy joins the strut between the bottom of back guy and the foot of the mast.

We have the stress in the back guy E.B. from the previous consideration on the stress diagrams as b.e. Beginning at e, follow along e.b. to b, from b draw a line parallel to B.C. until a line from the point c drawn parallel to C.E. will terminate at e. The length of the lines b.c. and c.e. when measured by the same scale will give the stresses in the support of the derrick B.C. and the strut between the back guy and the heel of the mast. As the stress in B.C. was found by moments in the beginning, we have a good check on the length of the line b.c.

Consider the parts of the derrick meeting at the foot of the boom. It will be noted that the stresses in all these parts have been found. To review the stress diagram start with the boom A.D. and follow the other members in order. Beginning with a, follow the stress in the boom to d, thence to e for the stress in D.E.; thence to c for the stress in E.C.; thence to a for the stress in C.A., the point of beginning. The reaction from the mast and boom which was found by moments to be 26 tons will serve as a check on the accuracy of the drawing.

To determine the sign of the stresses, tension, or compression, when drawing the stress diagram for each point, such as the top of the mast, the stress for D.B. is drawn from d to b in the stress diagram which will indicate that the stress is tension as its action in the part D.B. is away from the top of the mast. Likewise the stress in B.E. is tension because the stress diagram indicates the action of the stress is away from the top of mast. Also the stress in the mast is compression because drawing the line from e to d in the stress diagram indicates the stress is towards the top of the mast. It is customary in the stress diagram to indicate the compressive stress by + and the tension stresses by —.

Influences Which Shorten the Life of Condenser Tubes

An Interesting Experiment Showing the Influence of Pipe and Pump Layout on Air in Circulating Water

FOR many years marine engineers have been baffled by the erratic behavior of surface condenser tubes. Even though the very best of tubes are selected, in many cases the life of the tubes has proved but of short duration, and the trouble and expense arising from the failure of condenser tubes have been a matter of great concern in the operation of the ship.

It was thought some years ago that the development and standardization of admiralty tube metal with the improved methods of manufacture brought into this art by the metallurgist and the microscopist would enable the production of tubes whch would successfully combat corrosive action so often found in surface condensers. This, unfortunately, has not been true; for it is a known fact that the finest admiralty tubes obtainable frequently show a shorter life than those which were previously selected and manufactured with less care.

Many reasons and theories have been advanced and a great deal has been written on this subject during the past ten years; but none of the suggestions ventured appear to have aided in the least as a corrective measure.

A few years ago F. E. Payne, president of the Crane Packing Company, became interested in this subject in connection with the manufacture and the promotion of sales of metallic condenser packing. He realized that it was necessary to discover and eliminate, if possible, the source of the deleterious action or actions which affected the condenser tube life. With this thought in mind he instructed the writer to investigate this subject in order that we might discover, if possible, the source of the trouble. Some years ago, after examining a very large number of condensers in operation throughout the marine world, as well as the industrial and utility plants throughout the country and several condensers abroad, the writer became thoroughly convinced that the separation or introduction of air into the circulating water was the main cause of the rapid corrosion so often occurring to condenser tubes.

What is the source of the great amount of air necessary to accomplish this destruction? Many observers argue that should air contribute to the destruction of the condenser tubes it is logical to believe that same was contained in the water as entrained air or air in solution. The writer has always disagreed with any such claim, and has tended always to the belief that the air getting into the condenser was always greater than the amount of entrained air, or air in solution, which might normally exist in either sea or still water, and likewise felt that such air was introduced into the water often as a means of taking same into the condenser.

In order to observe actually what was carried into the condenser water boxes during the periods of operation, a ship was selected in which the condenser showed a rapid tube erosion. This ship's con-

denser was equipped with glass observation doors and the water compartments of the condenser were illuminated through the use of diver's lamps which made it possible to observe the flow of water in the water boxes as it entered the tubes.

At the time of installing this observation apparatus, the ship was lying alongside the dock at New York, and was loaded to such an extent that the overboard discharge from the condenser was approximately $2\frac{1}{2}$ feet below the surface of the water.

A dock trial was run and observations made throughout, and much to the surprise of all who were observing this run no sign of air could be detected in the water boxes of this condenser. It was thought that possibly the speed of the circulating pump might change this condition, and the speed of this pump was increased and decreased from minimum to maximum. Still there was no sign of air in the circulating water. The inflow ends of the condenser tubes appeared to be filled with salt water, and had this test been discontinued at this point the results were such as might forever have dismissed the thought that air was present in the circulating water.

The writer felt that the observations should continue throughout the entire range of operations of the ship's propulsion plant. Therefore, it was planned to continue these observations during the actual ship operation and at definite loading.

In order that this ship might discharge a portion of her cargo, a run of approximately 60 miles to another port was made; and during this run no air could be detected in the circulating water. It must be borne in mind that during this time the overboard discharge from the condenser was down two feet under the water.

Upon discharging a portion of the present cargo the ship rose out of the water to such an extent that the overboard discharge from the main condenser came approximately two feet above the surface of the sea, and, with this condition, the moment the circulating pump was started the condenser water boxes became filled with air and water, the air bubbles ocurring in the form of a literal breeze; and the globules of air were bombarded with great velocity into the inflow ends of the condenser tubes and flowed toward the corroded areas which could be observed at the inflow ends of the condenser tubes in a manner which might cause one to believe that they were literally attracted by these portions.

An examination of the lay-out of this condenser installation showed that the overboard discharge was placed directly above and immediately over the sea chest, and, while it is true that there is a difference in elevation between the sea chest and the overboard discharge of approximately 15 feet in the average marine lay-out, it is quite apparent that the overboard discharge, when above the water line, carries air down into the sea chest in large quantities.

The observation leads us to believe that the overboard discharge should be placed sufficiently aft of the main injection sea chest to prevent the return of the air and inducing a carrying down into the sea by the down-pour of the overboard discharge stream.

To anyone doubting the extent to which air is carried into the water by the downpour of a stream exposed to the air, let them make the following simple experiment:

Take a large glass bottle and partly fill it with water; then connect a hose line to a faucet and permit water to flow through this hose into the partly filled bottle and observe the tremendous amount of air carried in and down under the water by the down-flowing stream.

Diesel-Electric Tanker for the Tide Water Oil Company

A NEW coastwise, diesel-electric tanker under construction for the Tide Water Oil Company will carry as cargo approximately 20,000 barrels of gasoline and approximately 55,000 gallons of lubricating oil, the latter in individual tanks in the forward hold space. Her route will be between the limits of Portland, Maine, and Hampton Roads, Virginia. She will be manned by a crew of 18 men.

The hull construction is on the Isherwood system, and is being built and equipped by The Pusey & Jones Corporation of Wilmington, Delaware. The vessel will have a length of 255 feet, a beam of 44 feet, a draft of approximately 15 feet 6 inches, and a deadweight of about 2400 tons.

The power plant will consist of two 6-cylinder, non-reversible, heavy-duty, solid-injection De la Vergne diesel engines rated 625 shaft horsepower at 225 revolutions per minute. These will be direct connected to two direct-current generators each rated 410 kilowatts, 225 revolutions per minute, 250 volts, shunt wound. The generators and other electric equipment will be furnished by the General Electric Company.

In addition to the two main generators, there will also be three auxiliary generators, each rated 45 kilowatts, 240 volts, compound wound. Two of these generators will be mounted on shaft extensions of the main generators, and the third will be direct-connected to a 3-cylinder, solid-injection, Winton diesel engine. These three generators will furnish power for excitation and also for lighting and the operation of auxiliaries.

The propulsion motor will be a double-unit machine rated 1000 shaft horsepower, 130 revolutions per minute, 500 volts. It will consist of two 500-horsepower, 130-revolutions per minute, 250-volt motors mounted on a common shaft with two bearings and base.

Propulsion control will consist of the variable voltage (Ward Leonard) system, and will be arranged for operation from both the engine room and the pilot house. The propulsion control switchboard will be located in the engine room and will be of the dead-front type. A live-front type of switchboard for the auxiliary generators and lighting and power distribution circuits will also be located in the engine room.

Electrified auxiliaries include two main cargo pumps rated 75 horsepower each; two lubricating oil cargo pumps rated 15 horsepower each; a number of other pumps; and deck and other auxiliaries, the whole having an aggregate rating of 210 horsepower. Steering gear, capstan and anchor windlass will be of Allan Cunningham manufacture. Cooking and heating will be done electrically, although a steam boiler will be installed.

British Coasting Vessels

An Interesting Type That Still Favors Reciprocating Triples and Scotch Boilers

THE bulk of the coasting trade around the British Isles is carried out by a very able and seaworthy type of vessel which long experience has shown to be most suitable for working to a regular schedule throughout the year and in all weathers. These craft are known as coasters, and average from 350 to 700 tons deadweight, and, as will be seen from the accompanying illustrations, have a distinctive and by no means unpleasing appearance. Construction is invariably of steel to Lloyds or British Corporation, the hull being designed with a raised poop and quarter deck, well deck forward, and a high forecastle head which greatly enhances its sea-going qualities. The bridge and captain's quarters are usually about midships at the after break of the well deck, and, whilst steering shelters are provided, they are by no means so elaborate as the pilot houses fitted to American coasting vessels.

One of the distinctive features of the British coaster is the comparatively high power installed, the speed under service conditions being from 9 to 10 knots, and it is the recognized practice to fit engines having at least an equivalent indicated horsepower to the number of tons deadweight carried. In some cases this ratio is considerably exceeded by the power, and vessels capable of eleven or even twelve knots under favorable conditions are not uncommon.

In the case of a typical British coaster to carry 500 tons deadweight on a draft of 13 feet, the dimensions would be as follows: Length between perpendiculars, 145 feet; breadth, 26 feet; and depth, 12 feet 6 inches at the well deck. One long cargo hold with a portable wooden bulkhead amidships would be provided, and although water-tight bulkheads are fitted at either end of the hold, it is not the usual practice to have any water-tight division in order not to break the stowage of bulky cargoes. Two large hatchways are arranged together with an elaborate system of powerful winches and derricks for loading and discharging as rapidly as possible; and special stiffening is often arranged in the bottom for grounding at low tide.

Up to the present time steam machinery has been preferred as a means of propulsion, and although two or three craft of about 350 tons deadweight and a number of smaller coasters of 150 to 200 tons have been equipped with semi-diesel engines up to 350 brake horsepower, nothing has as yet been done in the way of building large motor coasters; and, until the price of suitable internal combustion machinery is considerably reduced, there is not much prospect of its being adopted. The power plant of a 500-ton coaster would consist of a set of triple expansion engines having cylinders 14, 22, and 38 inches by 24-inch stroke, steam being supplied by a single-ended, return tube boiler 13 feet 6 inches diameter by 10 feet, burning coal as fuel and developing 550 indicated horsepower for 10 to 10½ knots.

Four typical coastwise British steamers. Top to bottom: Steamship Torfrey; Steamship Noos Head, discharging aground; Steamship Felspar; and Steamship Stanley Forge.

Some of the companies engaged in the British coastal trade own a considerable number of ships of this type, and besides trading between home ports, maintain regular Continental services, principally to France, Belgium, and Holland.

Trade Literature

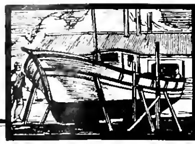
Commerce Yearbook for 1928 — Volume II, Foreign Countries. Published by Superintendent of Documents, Washington, D.C. Price $1.25.

This is a source book of information on world business compiled by the U.S. Department of Commerce, Bureau of Foreign & Domestic Commerce, and contains the latest facts and figures on the commerce and industry of 65 countries. The purpose of the book is to provide a convenient source of information on current trends in international industry and trade for exporters, importers, bankers, manufacturers, economists, publicists, students, and others interested in world business.

It is the sequel to Commerce Yearbook on Domestic Commerce, previously published, price $1. The books may be obtained from any branch office of the Department of Commerce.

Baltimore Association of Commerce, 22 Light Street, Baltimore, Maryland, has issued **Directory of 1929**, listing alphabetically and under classification all the business houses of Baltimore, transportation companies and agencies, foreign and coastwise shipping laws, general and useful information for shippers and traders.

International Nickel Company, 67 Wall Street, New York, N.Y., has recently printed Bulletin No. 13 on Nickel Steel, giving complete data and applications on torsion, impact and other mechanical properties of SAE-3130 Nickel-chrome steel.



Workboats and Their Power Plants

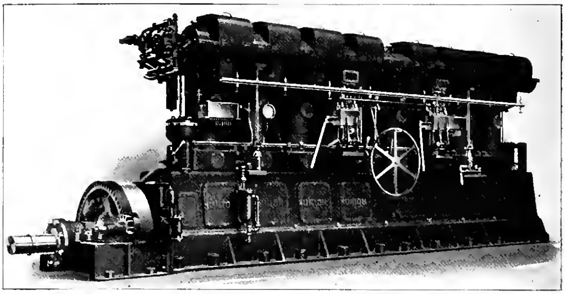
Larger Tuna Boats

THE Campbell Machine Company of San Diego has recently taken contracts to build two of the largest tuna fishing boats yet laid down in California. These vessels are to be identical, one being for Manuel Freitas and the other for Joaquin Medina & Co.

The general characteristics of these boats are:

Length over-all	120′0″
Beam	27′0″
Depth of hull	11′6″

They will be built of Oregon pine, heavily timbered to the designs and following the well-known practice of this very competent wooden shipbuilder. An interesting feature in connection with the equipment of these boats is that they are said to be the first fishing boats built in California to be equipped with all electrical driven auxiliary machinery.



Eight cylinder, 400 horsepower Union diesel engine on the test block at the plant of the Union Diesel Engine Company, Oakland, California. This engine was installed in the yacht Norab.

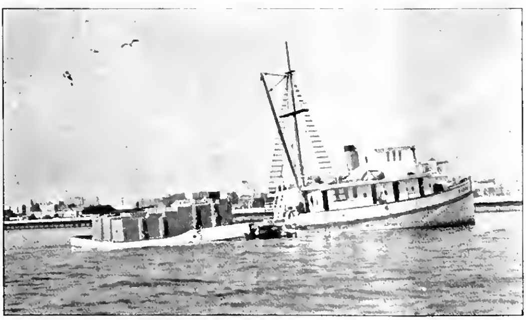
The main power plant will consist of a 400-horsepower, 6-cylinder, directly reversible marine diesel engine built and supplied by the Union Diesel Engine Company of Oakland, California. It is interesting to note in this connection that in the case of each boat the Union diesel engine is a repeat order, Manuel Freitas being already the owner of a Campbell built 95-foot fishing boat, the Del Monte, powered with a 225-horsepower Union diesel, and Joaquin Medina & Co. being interested in the ownership of an older boat powered with a 150-horsepower Union diesel.

For auxiliary power two 30-kilowatt Westinghouse generators are to be installed in each boat. One of these is to be driven by a 45-horsepower Union diesel engine directly connected, and the other by belt drive from the main engine. These two generators will supply light and power for the auxiliary machinery.

The boats will be built with large bait tanks and fish holds served by an 8-ton York refrigerating system with 3000 lineal feet of brine coils. The ammonia compressor of this York refrigerating system will be driven by a 10-horsepower Westinghouse marine type motor.

Two bait pumps will be installed, each of the centrifugal type with 8-inch suction and 6-inch discharge, directly driven by a 7½ horsepower Westinghouse motor. The bilge pump, anchor windlass, and cargo winch are all of the Campbell Machine Company make and are each driven directly by Westinghouse electric motors.

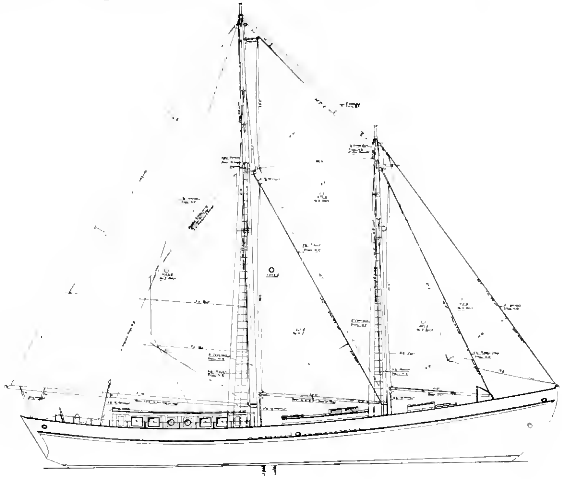
These two vessels are contracted for delivery July 15, 1929, at a cost of $95,000 each.



An interesting view of the tuna fishing boat Mariner shortly after collision with a tanker, in which the Mariner was nearly cut in two.

The Campbell Machine Company reports that the yacht Norab, fully described in the January issue of Pacific Marine Review, on a recent business cruise to Ensenada, Mexico, averaged 12 knots on the entire trip and that the owner is very well pleased with his ship and her power plant. This yacht is now on a two months' cruise in the Gulf of California and along the Mexican coast.

An Interesting Cruiser Design



Outboard profile and sail plan.

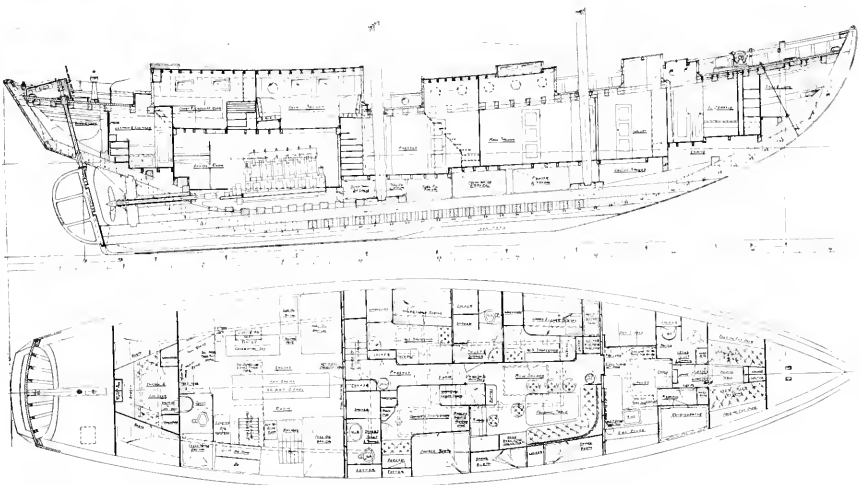
THE illustrations accompanying this article give a very good general idea of the design of a 95-foot diesel auxiliary schooner yacht drawn up by C. Padgett Hodson, San Francisco naval architect, for a San Francisco yachtsman.

Bids have been called for the construction of this boat, and it is hoped that construction will commence in the near future. The requirements given the naval architect on this job were for a cruiser with a draft shallow enough for navigation on San Francisco Bay and its inlets and for seaworthiness and cruising ability to make her comfortable for extended ocean cruises, such as to Hawaii and the South Seas.

The over-all length of 95 feet, while sufficient to accommodate the required number of guests comfortably, allows a somewhat short overhang at the bow and stern. The beam is 23 feet 3 inches, draft 10 feet 6 inches. The timbers are very heavy for this size craft, and will more than meet Lloyd's A-1 requirements in all respects.

The sail rig was designed to work the yacht with as small a crew as possible—a stay-sail schooner rig with a minimum of area. A novel feature in the design of the accommodations in the general layout is the large enclosed deck lounge with floor sunk sufficiently below deck level to give good head room without interfering with the working of the sails. This should be a very comfortable feature on long cruises.

The main power plant is figured for 150 horsepower diesel engine, directly reversible, and with clutch for releasing the propeller when traveling under sail. This clutch is to be incorporated in the bedplate of the engine.



Inboard profile and accommodation plan of auxiliary schooner yacht designed by C. Padgett Hodson, San Francisco naval architect.

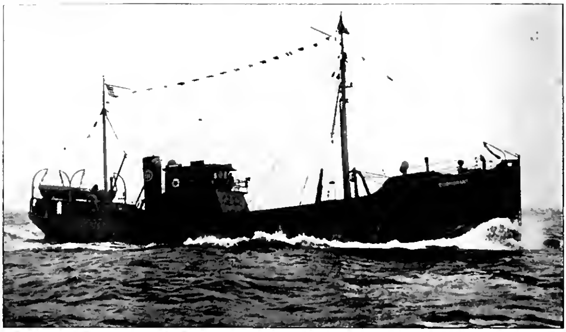
Trawler Cormorant Converted

Nelseco Diesel Engine Replaces Steam Plant on Large Steel Trawler

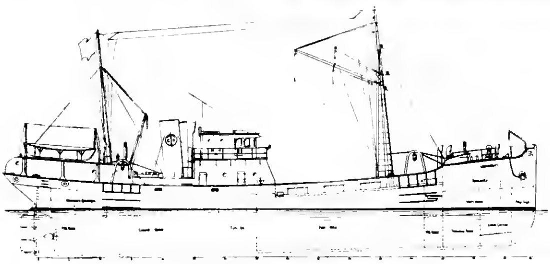
ON January 2 the New London Ship and Engine Company of Groton, Connecticut, held successful trials of the large converted steel trawler Cormorant, which it had completed for the Ocean Trawling Company of Boston. The hull of the Cormorant was originally designed and built by the French government as an auxiliary naval vessel and is of all steel construction.

As converted to diesel propulsion for commercial fishing, her principal characteristics are:

Length over-all	150′0″
Length between perpendiculars	139′5″
Beam molded	25′0″
Depth molded	14′7″
Capacity: Fresh water, gals.	15,000
Capacity: Fuel oil, gallons	25,000
Speed (approximate), knots	10.5
Radius of action (approximate), full speed and full tanks, knots	8,000
Main engine; Nelseco; brake horsepower	500
Auxiliary engine: Nelseco; brake horsepower	115
Capacity of fish (net), lbs.	400,000
Capacity of ice, lbs.	100,000
Capacity of total cargo, lbs.	500,000



The converted trawler Cormorant on her trials.

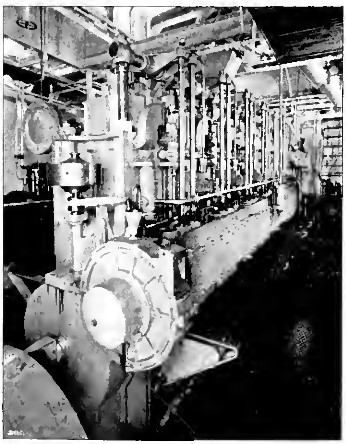


Outboard profile of Cormorant.

The pictures and profile herewith give a very good idea of the neat, business-like appearance of this craft and of the comfort and convenience of her interior arrangements. There are comfortable accommodations for 16 men in the forecastle. Officers and engineer personnel are housed aft.

The main propulsion unit is a 500 brake horsepower, 4-cycle, single-acting, 6-cylinder, mechanical injection, Nelseco diesel engine, directly connected to the propeller shaft and directly reversible. On sea trials this engine drove the Cormorant easily at 10.5 knots an hour.

All auxiliary machinery on the Cormorant is electrically driven. Electric power is provided by a 115-horsepower Nelseco diesel engine driving an Electro-Dynamic, 250-volt generator. Fresh water piping, serviced by two motor-driven pumps, supplies the galley, officers' and crew's quarters, and sanitary system. Piping from 5x8-inch Triplex plunger type motor driven fire and bilge pump is connected to every compartment of the ship for both suction and discharge. This pump will throw 180 gallons a minute against a head of 70 pounds.



500 brake horsepower, 6-cylinder, 4-cycle, Nelseco diesel engine in the engine room of the Cormorant.

The trawling winch housed at the forward end of the deck erection, is driven by a 75-horsepower Electro-Dynamic motor. A complete refrigerating plant is installed, cutting down the ice consumption. With fifty tons of ice aboard, the Cormorant has a net fish capacity of 200 tons. This capacity is said to be the top record for American trawlers.

The test of propulsion plant and auxiliaries was highly satisfactory to her owners, and she is now profitably engaged in deep-sea fishing.

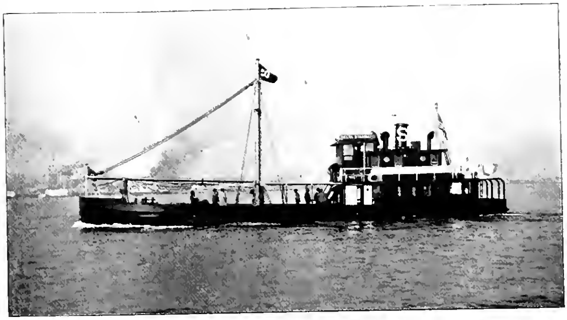
A Tanker, a Cruiser, and a Cutter

The illustration at the right gives an excellent idea of the new Delta Standard, a shallow draft motor tanker recently delivered to the Standard Oil Company (Calif.) by the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd.

The Delta Standard is 101 feet 4 inches over-all length and an even 100 feet between perpendiculars. She has a molded beam of 22 feet and a beam over-guards of 23 feet 5 inches. She provides tanks for 22,000 gallons of gasoline, a weight of 63½ tons, and space to accommodate 24.6 tons of package freight on a draft of 5 feet.

Her power plant consists of two Sterling Petrel 150 horsepower gasoline engines operating through reduction gearing, which, on fully loaded trial drove the boat at 9 knots. A 5-kilowatt Universal generating set takes care of the auxiliary electric load. Kinney pumps driven by Novo gasoline engines are used for moving the cargo.

King-Knight Company of San Francisco furnished the power plant.



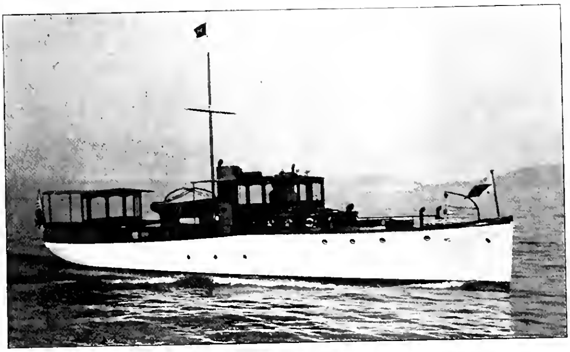


Illustration at left shows the beautiful cruiser Hoqua owned by E. M. Mills of San Francisco. This cruiser has recently been equipped with a Model 600 Delco lighting unit, which takes care of electric lights for all of the accommodations and for navigation.

Another interesting feature in connection with this boat is the complete Lux system for protection of the engine room and the bilge against fire hazards.

The Lux system was installed by Hough & Egbert of San Francisco, representing Walter Kidde & Co. of New York.

Illustration at right gives an excellent bird's-eye view of the new revenue cutter Tahoe. This fine ship is now stationed permanently on the Pacific Coast, operating out of San Francisco Bay. The Tahoe is one of five revenue cutters built by the Fore River Plant of the Bethlehem Shipbuilding Corporation and powered on the modern central station plan, with turbo-electric propulsion by the Westinghouse Electric & Mfg. Company.

The Tahoe and her sister vessel, the Chelon, which is operating out of Puget Sound, should be of great assistance to all legitimate marine enterprises on the Pacific Coast and will undoubtedly cause some trepidation among the illegitimate navigators.

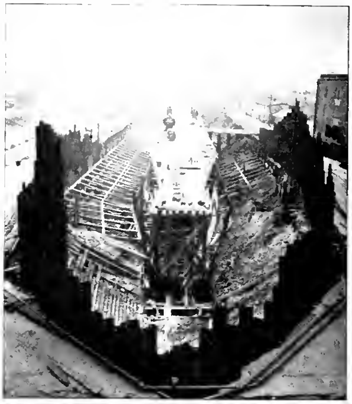
Auxiliaries-Ship Supplies-Marine Equipment

New Dock at Erie Basin

Todd Shipyards Corporation Adopt Interesting Methods in Building the Largest Graving Dock in New York Harbor

DESPITE unusual difficulties encountered in excavations, rapid progress is being made in the construction of the Todd Shipyards Corporation's mammoth graving dock at its Robins plant in Erie Basin, Brooklyn.

The 500-ton floating steel gate, fabricated at the Tebo yard, was launched recently, and everything indicates that the dock will be ready for service in the fall, at which time the Todd Shipyards Corporation will be able to dry-dock in one day 175,000 tons of shipping. The new dock, which is 715 feet long, 113 feet wide at the top, and 93 feet wide at the bottom, will be the largest dock in New York harbor, and will give New York facilities for the handling of large liners that it has never before possessed.



Above: View from the inshore end of the new graving dock at Erie Basin, Brooklyn, showing use of sheet steel piling for shutting out surface water. Below. Airplane view of the Erie Basin Plant showing location of the new dock and its pump well.

Surveys made preliminary to the commencement of the work indicated that soil conditions similar to those found at the time of the construction of the Brooklyn Navy Yard dock existed in the Erie Basin area.

In the navy yard job the contractors started to use steel sheet piling; but when boulders were encountered the piling broke up; and when attempts were made to dig out the boulders sand ran through the breaks. A settlement of buildings in the vicinity followed, and a sewer broke. To complete the job, the site was surrounded by a cut-off of concrete pneumatic caissons which was an effective but very expensive method. Admiral F. R. Harris had charge of the Navy dock at that time, and it is under his supervision that the Todd corporation is building the new dock.

For this job a very effective steel sheet piling, made by the Bethlehem Steel Company, is being used. This piling is a new Lackawanna section developed recently. The piling has been practically all driven, and where boulders were encountered the driving was stopped while the boulders were dug around and removed.

The construction work has been divided into two sections, the inshore 500-foot section being on the site of the old dock, which was surrounded with sheet piling and dug to a depth of about 16 feet below the old foundations. This method is an innovation in dry-dock construction. Instead of trying to make the dock absolutely water-tight, which would require an enormous amount of excavation and concrete, the water flow in is cut off with sheet piling and the center part of the dock, which rests on timber piles, is open, permitting ground water to seep up through the floor and be

taken care of by the drainage pumps. The design of the inshore section of the dock is a combination of the old timber type construction and the modern concrete type.

The 250 foot outshore section of the dock, which goes beyond the gate of the old dock, will be constructed without removing the water. The site is being excavated by dredges; timber foundation piles will be driven; and steel trusses and forms placed across the dock. The space between the trusses will be filled with concrete under the water with a 12-inch pipe Tremie. After all this concrete is placed, the area is pumped out and walls and floors placed in frame construction and connected up to the inner dock, which, by that time, will be completed. This is a rather novel method of construction. Something similar was tried on the Pearl Harbor dock and also on the dock at Kobe, Japan.

To pump out the dock the pump well, in which the pumps and other machinery will be placed, was built on the surface of the ground 60 feet high. It was sunk to its position by digging out inside three digging wells. It was built up as it sank to place. This was done so as not to interfere with the handling of vessels in dock No. 2, 50 feet away. To finally settle the well to the designed position it was weighted with 1000 tons of pig iron. With the settlement completed, the bottoms of the three digging wells were sealed by depositing concrete under water with the Tremie, the caisson pumped out, and the interior finished. This is a familiar method of constructing deep bridge pier foundations, but was never used before on a dry dock pump well.

The main pumping plant will consist of two large 48-inch spiral screw pumps driven by two 700-horsepower Westinghouse motors, so that the dock can be unwatered in less than two hours.

Bronze Welding a Diesel Engine Frame

A RECENT welding repair operation that saved much time and money for an Atlantic Coast towing company is described in the January issue of "Oxy-Acetylene Tips," as follows:

Most of the tugboats built within the last five or ten years have been equipped for speed and service with diesel engines. They are able to travel much faster and maneuver much more quickly than the old coal-burning type.

Recently a diesel-engine operated tugboat, one of a fleet of fifty, suffered an accident in which the connecting rod of one of the cylinders went through the two sides and the base of the engine frame. After being towed into port, the owners made investigations to discover the easiest way to repair the breaks. Speed of repair was greatly desired because to tie up this tugboat represented a loss of hundreds of dollars each day. This firm maintains a dry-dock and shipyard fully equipped with all means for making repairs, including, of course, oxy-acetylene welding and cutting outfits. Bronze-welding was immediately decided upon.

The rear side of the engine casting was badly cracked from the impact of the connecting rod. This side of the engine base is made entirely in one piece, and here are located the oil feed lines and other connections; the other side has crank case doors which are made of cast iron and which are removable from the side of the engine for the purpose of inspection of the crank shaft, connecting rods, and oil pit. The connecting rod had broken out one of these doors on the other side of the engine, and also a section from the engine base. The door was, of course, replaceable and a new one was immediately ordered; but the engine base, smashed into many pieces, had to be repaired.

The broken pieces of the base casting from this side were taken to be joined together by cast iron welding at the dry-dock welding shop. While this was being done, the welder chipped out along the lines of the cracks with a compressed air chipper. Care was taken that the cracks should be chipped considerably beyond the visible end of the break. The welder then commenced to bronze-weld the broken parts in place.

After the welding was finished, the seam was brushed with a wire brush to remove excess flux.

Attention was then turned to the side of the base, where the parts had been broken out. The chipper was again used to vee out all the cracks, and the broken pieces, already assembled by cast iron welding, were brought back to the hold and set in position. The vee in this metal was about 2 inches wide, and the length of the break was about 2 feet in all. This was completely filled with bronze welding rod, and a substantial reinforcement built up over the edges of the nearby metal.

The next morning the welding had been completely finished and the tugboat was put back into service. It has been in operation for some time now and there is no sign of any crack or weakening of the casting even though it is submitted to very severe service, undergoing a great deal of vibration. The officials of the tugboat fleet have been very pleased with this repair, and expect to repair any further accidents of the sort in the same manner.

Bronze-welding in this case was the only method which could be used, not only on account of the fact that it would be unnecessary to preheat but also because the casting could not be moved from place without entailing an enormous expense. The low cost of the bronze-welded repair is another feature which recommends it highly.

Improved Welding Gloves

OXWELD Acetylene Co., 30 E. 42nd Street, New York, has added to its line of accessories for oxy-acetylene welding and cutting gauntlet gloves of a soft and pliable suede leather specially treated to prevent heat from affecting it, to supersede the Oxweld horsehide gloves formerly supplied.

A leather strip on the thumb seam and a semi-circular reinforcement on the inside seam adjoining the palm reinforce the glove. The left glove has a leather reinforcement covering the entire back between the fingers and gauntlet for protecting the back of the left hand during cutting operations. A close-fitting gauntlet adequately protects the arms. The reinforcements make them very durable.

These gloves will not stiffen or shrivel from the application of heat or from soaking in water.

General Electric Company, Schenectady, New York, has ready for distribution the following leaflets:

GEA-874C. Type WD-200A Arc Welder.

GEA-876B. Type WD-400A Arc Welder.

GEA 1031A. Type AW Resistor Arc Welders.

Lincoln Safety Push Button

A NEW safety type push button recently developed by the Lincoln Research Laboratories is now being marketed by The Lincoln Electric Company, Cleveland, manufacturers of Linc-Weld motors and Stable-Arc welders.

The design of this new safety push button is a departure from the usual type of push button switch design in that it offers unusual safety features. A ball top "start" button is contained inside a large "stop" button which projects over the "start" button.

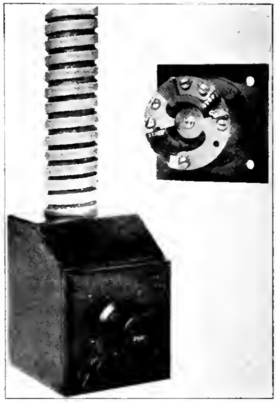
Thus the large projecting "stop" button protects the "start" button from accidental contact. The "start" button can only be operated by the tip of a thumb or finger inserted inside the "stop" button. The "stop" button can be operated by a finger or palm of the hand. The colors of push buttons are in accordance with the accepted standard signal colors for controlling railroad, vehicular, and pedestrian traffic. The "start" button is of vivid green moulded Bakelite with the word "Start" in white letters across the ball top face of the button. The surrounding "stop" button is of brilliant red moulded Bakelite.

The inner mechanism is enclosed in an arc-welded steel box $2\frac{1}{2}$ by $3\frac{1}{4}$ by $2\frac{1}{2}$ inches in size. All insulating parts are molded Bakelite. The entire exterior of the Lincoln safety push button is jet black with the exception of the push buttons.

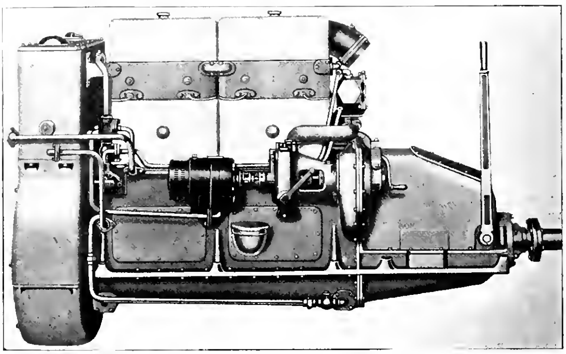
Another distinguishing feature of the new safety type push button is the ease of installation. Four screws hold the moulded black Bakelite face plate to the container. By removing these screws the entire operating mechanicm may be removed from the case for wiring.

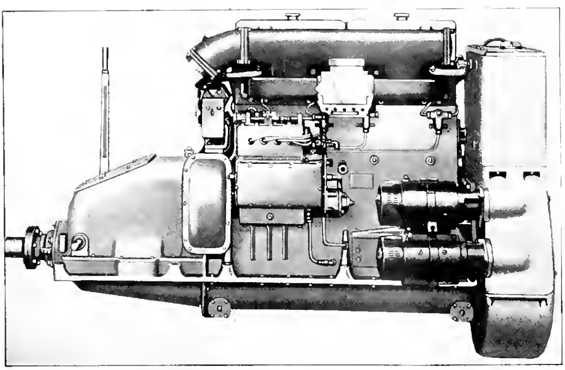
The binding posts are plainly indicated by white letters on the molded black Bakelite, thus preventing chance of error in making connections. In top of the steel case an opening 7/8 inch in diameter permits entrance of conduit enclosed wire to the button. For easy attachment there are two holes in the back of the case for bolts, rivets, or screws.

This safety type push button was designed primarily for use with the Lincoln induction starter, but is available and suitable for use with any type of push button starter.



The new Lincoln safety push button for motor starters.





THE BUDA DIESEL

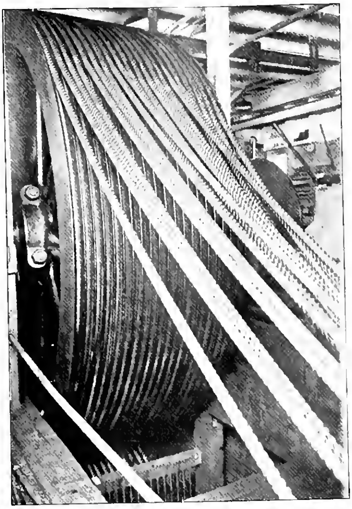
Our illustrations give a very clear idea of the external appearance of the new Buda-M.A.N. marine type diesel with reverse gear incorporated. This 4-cylinder plant generates 100 brake horsepower at 1000 revolutions a minute. It is equipped with electric generator circulating water pump, dual electric starting motors, and self-contained lubricating oil cooling and filtering system. The basic design is the product of the experience of the M.A.N. diesel builders and designers of Germany. In the Buda product, as here shown, this basic design is adapted to American practice for production and installation.

Buda distributors on the Pacific Coast are: Richard Froboese Company, Seattle; Wm. Silva Company, San Francisco; and Ets-Hokin & Galvan, Wilmington.

H. W. Benduhn is Pacific Coast Sales Manager.

Roping an Island out of the Fairway

ROPE in various forms is one of the oldest mediums for the transmission of power. Originally used largely as a convenience for multiplying human power, it is still used under certain conditions in the most modern engineering as one of the best methods for power transmission. Since history first began to be recorded, there have been numerous instances of rope being used for the purpose of multiplying human power in the pulling down of walls of besieged cities; and over three thousand years ago there was recorded in the Second Book of Samuel the advice of a shrewd minister to a young and very much puffed-up king that, when his enemy had taken refuge in a city, the king should "gather all Israel together and fasten ropes to the city and drag it into the river."



Tubbs Red Thread Transmission of Power rope drive on dredger John McMullen.

Today the San Francisco Bridge Company has in a very real way fastened power transmission rope to an island in Los Angeles Harbor and is rapidly dragging that island out of the harbor for the purpose of clearing the channel and of making a large fill on tide lands more conveniently situated for industrial purposes.

The rope drive in question is illustrated herewith. In consists of 20 separate 1¾-inch diameter ropes used with grooved pulleys. The large driving pulley, 13 feet in diameter, is mounted on the crank shaft of a 20- by 40- by 36-inch cross-compound Nordberg Corliss engine. The driven pulley, 5 feet 4 inches diameter, is mounted on the shaft of a 22-inch centrifugal dredging pump, the complete unit forming the pumping system of the dredge John McMullen. Each of the ropes is 102 feet long, and is expertly spliced in place on the pulley with a long splice, giving the full strength of the rope in the splice and at the same time maintaining the exact diameter of the rope.

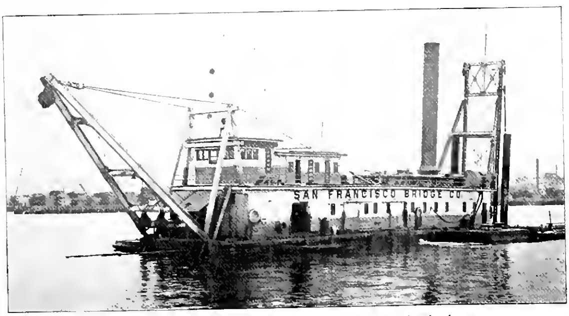
Since the installation of this drive, the San Francisco Bridge Company has used only 4-strand Tubbs Red Thread Transmission of Power rope, and has always employed expert splicers from the Tubbs Cordage Company, San Francisco, for putting the ropes on the pulleys.

For some time after the first installation of the drive, the rolling and jerking motion of the dredger occasionally caused the ropes to jump out of the grooves and cross over, thereby cutting or breaking the rope. To prevent this, guides were installed close to each pulley. These guides were made of oak slats with spacers between, and they have entirely eliminated the trouble. The last set of ropes on this dredger was in continuous service for almost exactly six years and has only recently been replaced.

The Island being removed is known as Deadman's Island, and lies at the entrance to Los Angeles harbor. The dredge John McMullen through its centrifugal pump is sucking away the material of this island, and forcing it by pipe over to and back of a 7000-foot riprap faced levee, beyond which 62 acres are being reclaimed for industrial purposes. The contract under which the San Francisco Bridge Company is working includes the moving of 2,000,000 cubic yards of material and building of the levee for retaining the fill. Captain E. E. Mattson is in charge of the entire job, and expects to complete the work during the summer of this year.

For those who like to speculate on nomenclature, it may be interesting to note that these dredging operations uncovered the skeletons of eleven men near the top of the island. Deadman's Island has long been a landmark for vessels entering Los Angeles harbor and will probably be much missed by Pacific mariners.

Tubbs Red Thread Transmission of Power rope has a fine record for long life and efficiency in numerous and varied installations and locations on the Pacific slope.



Dredger John McMullen at work in Los Angeles harbor.

The Bauer-Wach Exhaust Turbine System

THE Bauer-Wach exhaust turbine system consists of a turbine that takes the exhaust steam from the low pressure cylinder after it has done its work and expands it down to very low pressure, exhausting it into a condenser containing a high vacuum. At boiler pressure the steam turbine has no advantage over the piston engine: at low pressure, however, the latter is limited by the comparatively small volume of the low pressure cylinder.

These facts led to the building of marine installations in which the high pressures were utilized in piston engines and the low pressure in "exhaust turbines." Such, however, were only built for large powers, as it was considered necessary to give the exhaust turbine its own shaft and propeller. This arrangement had the disadvantage that the turbine was arranged to drive directly on the shaft. A direct-connected turbine is not only heavy and expensive, but its revolutions are much too low for economical steam consumption and too high for propeller efficiency. Even with these disadvantages, several large vessels were fitted with this combined system in which the expansion of the steam exhausted from a reciprocating engine was continued in a low pressure turbine. The steamer Otaki was the first vessel fitted in 1909, followed closely by the Laurentic of the White Star Line in April 1909. In June of the same year the Megantic came out identical with the Laurentic, except she had quadruple expansion engines. Both these vessels were in the Canadian-Atlantic trade, and over a period of two years very careful data kept from actual performance show an advantage in coal consumption of 20.4% in favor of the Laurentic, also better speed by ¾ to 1 knot per hour. Based on these results this combination machinery was adopted for the Olympic, Titanic, Britannic, Belgenland, and others. The Olympic has been a remarkably successful and economical vessel (especially since the conversion to oil fuel), averaging 0.85 pound per indicated horsepower per hour for all purposes. The machinery consists of two reciprocating engines developing 15,000 indicated horsepower each, and a turbine on a separate shaft direct-connected developing 15,000 indicated horsepower; total 45,000 indicated horsepower. Although these vessels showed reliable and economic operation, the arrangement could only be used on large vessels.

Dr. Bauer and Dr. Wach, the eminent German engineers, having large experience in the manufacture of gears and flexible couplings and in research work on vibration in rotary systems, have developed the system which bears their name, making possible the combination of the reciprocating piston engine and the turbine on one propeller shaft and the fitting of same to almost any existing reciprocating engine.

In this arrangement the turbine uses the exhaust from the low pressure cylinder at a few pounds pressure and exhausts into the condenser at as high a vacuum as possible. The steam being of large volume and the range of temperature about 100 degrees only, no close clearances are required and the turbine is of rugged construction. In this way the power is increased about 30 per cent with the same fuel consumption; or, if the extra power is not required, a saving in fuel is effected of 20 to 25 per cent.

The installation is simple, the present thrust shaft and bearing being removed and replaced by this machine, consisting of turbine, double reduction gears, and hydraulic clutch mounted on one bed plate. A shaft with one collar thrust is fitted and connected at the after end. The large main gear is mounted on a hollow shaft, inside of which the engine shaft can move or vibrate without affecting the gears. On the second reduction a Vulcan hydraulic coupling is fitted. This coupling has no metallic contact. When it is filled with oil it depends entirely on the pressure of the oil for holding and slips only about 3 percent. It is controlled by filling and emptying. It takes the jar of the engine and allows the turbine to be thrown in and out slowly and without shock. It prevents racing and keeps the engine running steady in a seaway.

A change-over valve is fitted for by-passing the exhaust directly to the condenser. This valve and coupling are operated by a common oil system using the same lubricating oil as the gears at 45 pounds pressure. When it is desired to cut in the turbine the oil coupling is gradually filled. As it fills, the turbine begins to revolve slowly and, when full, pressure develops which operates the change-over valve and automatically shuts the exhaust to the condenser and opens it to the turbine. When it is required to cut out the turbine in case of maneuvering, a connection from the reverse shaft acts on the change-over valve, allowing the exhaust to go to the condenser and the oil to flow out of the coupling automatically, leaving the engine free to go ahead or astern at its full power without the turbine. These operations can be done by a separate lever; but the engine cannot be put astern or stopped without the change-over valve operating on account of its connection to the reverse lever. The mechanical connection, although positively locked against any movement of the reverse shaft, is so arranged that the turbine may be engaged or disengaged by working the lever by hand at any time when the engine is running ahead.

In making the installation for an increase of power, the revolutions per minute will usually go up eight or ten but, as the power of the piston engine is less and the turbine movement much easier and steadier, it has not been necessary to change either the shafting or the propeller. The latter in some cases can be changed for a more efficient design. As a high vacuum is required, an air ejector and usually some changes in the condenser and circulating pump are necessary, depending on the trade and the temperature of the sea water. Circulating pumps can usually be speeded up to get enough water.

A much larger opening has to be made in the condenser to take the turbine exhaust. The thrust recess requires to be made larger; a new foundation built for the machine in place of the thrust; a sump tank fitted for the oil to drain into; two pumps, one for spare; a cooler and a gravity tank as high as possible as all bearings and gears are oiled by gravity. The shafting is so arranged that it can be disconnected and proceed with the piston engine alone, or, in case of trouble with the engine, it can be disconnected quickly by breaking a coupling and proceed with the turbine alone at 40 percent of the power.

The Bauer-Wach exhaust turbine system was developed slowly and surely and only after a great many

experiments were tried. Now, a little over two years since the first installation was made, the latest list shows there were on order or installed 49 new vessels and 67 conversions with a total well over 500,000 horsepower. No trouble has been experienced, and in every case the estimate of increased power or saving in fuel has been exceeded and progress made in better and simpler designs. The range of installations runs from the trawler of 700 indicated horsepower to the Cleveland of the Hamburg-American Line, 17,000 tons and 10,000 horsepower. Several vessels with 6500 horsepower on one shaft have been installed.

Sales and installations of the Bauer-Wach exhaust turbine system are being handled in the United States by the American Bauer-Wach Corporation, 11 Broadway, New York.

Echo Sounding Expands Rapidly

During the past twelve months electrical echo-depth sounding has become more generally accepted in marine circles. This method of simplifying the operation of taking soundings, as incorporated in the Fathometer, has been adopted by numerous merchant marine vessels and first-class yachts. The principle of sounding by sound and by flashes of light indicating depth on a dial is now embodied in the Fathometer for vessels of various sizes and speeds, according to a review of the year by the Submarine Signal Corporation.

The steamship Leviathan of the United States Lines, the Mauretania of the Cunard Line, and the Columbus of the North German Lloyd Line have now been equipped with this most automatic electrical sounding equipment and officials are most enthusiastic about the Fathometer. Installation of Fathometers has been specified for three tankers of the Standard Oil Company (New Jersey), two vessels of the United Fruit Company, and several of the Clyde Line. The more progressive steamship companies are rapidly adopting this modern aid to navigation.

Among yachts equipped with the Fathometer, which is produced by the Submarine Signal Corporation to measure ocean depths by sound echoes, are Arthur C. James' Aloha, Ernest Behrend's Amida, Julius Fleischmann's Camargo, D. Jackling's Cypress, George C. Bourne's Lone Star. Other vessels previously equipped with the Fathometer include H. P. Bingham's Pawnee, W. K. Vanderbilt's Ara, R. M. Cadawalader's Savarona, Eldridge R. Johnson's Caroline, Cornelius Crane's Illyria, Irving T. Bush Jr.'s Coronet, Gerard B. Lambert's Atlantic, Max Fleischmann's Haida, and W. L. Mellon's Vagabondia.

The most recent vessels to have the Fathometer included in their specifications are the three identical yachts to be built by Pusey and Jones Corporation for prominent automobile executives, including W. P. Fisher and A. P. Sloan, Jr., of the General Motors Company. H. E. Manville is also to have a Fathometer installed upon his yacht which is being built at the Bath Iron Works, Bath, Maine.

On a recent trip to Miami and return, the Shawnee of the Clyde Line used its Fathometer constantly with excellent results. Captain Devereaux reports that in checking his charts the Fathometer showed great accuracy as each light vessel was made. He considers that it should be included as a part of the standard navigational equipment of every ship.

In addition to these boats, a number of yachts for which specifications are now being drawn by architects will have Fathometers on board.

Besides the element of safety in navigation, due to constant knowledge of the depth of water under the keel, the Fathometer enables the owner to follow the hills and valleys of underwater topography, as the instrument gives many soundings a minute, and thus reveals the smallest variations in the ocean bed.

The new coastwise Fathometer, perfected by the Submarine Signal Corporation, is especially valuable for coastal waters, where vessel owners are interested principally in obtaining soundings of depths from 3 to 130 fathoms.

The Fathometer is simple in construction, containing three main parts, an oscillator which produces the sound, a hydrophone which receives the sound "echo," and an indicator which controls the emission of sound and translates the time interval between sending and receiving into a visual measure of depth on the dial of the indicator. This system embraces advantages not found in other methods of determining depth. The officer on watch can get his soundings by merely watching the Fathometer dial. He does not have to leave the bridge, and he needs no one to help him. He observes the continuous soundings many times each minute as long as the device is left in operation.

Trade Notes

Robert M. Gates, who is well known as the manager of the industrial department of **The Superheater Company**, has been elected vice-president of that company. Mr. Gates affiliated himself with The Superheater Company in 1922 and has since been actively engaged in directing the engineering and sales of Elesco products.

Mr. Gates is a native of Iowa. Following his graduation from the School of Engineering, Purdue University, in 1907, he served as a special apprentice on the Pennsylvania Railroad and with The Browning Engineering Company of Cleveland until 1910. The next few years he had his own engineering office in Cleveland, and later was associated with The Thew Shovel Company, Lorain, following which he was manager for the Lakewood Engineering Company of Cleveland.

Cutler-Hammer, Inc., of Milwaukee, announces that it has acquired the business of the Trumbull Vanderpoel Electric Manufacturing Company, of Bantam, Connecticut, which will be operated as a subsidiary under its present name.

This purchase will add a complete line of meter service and safety switches to the present Cutler-Hammer line of motor control, wiring devices, and allied electrical items.

Ray Marine Steam Turbine Type Oil Burners have been installed on several vessels of the Alaska Salmon Company; namely, the steamers Gracier, Costa Rica, and Elwyn C. Hale. Announcement was made by W. R. Ray, head of the W. S. Ray Manufacturing Company of San Francisco.

The Sperry Gyroscope Company, together with all of its assets, obligations, and business in all parts of the world was acquired on January 21, 1929, by **Sperry Gyroscope Company, Inc.**

Passing of the Bath Steward

ANNOUNCING the recent further improvement of passenger accommodations on the liner City of Los Angeles, the February issue of "Lassco Log" has the following very pertinent remarks on the high standard of luxury demanded by Pacific travelers:

But a few years ago, the bath steward on a liner was one of the important members of the steward's department to be interviewed after the passenger had seen his baggage placed in his stateroom, especially if that passenger wished to arrange for his bath each morning during the rush hours just before breakfast.

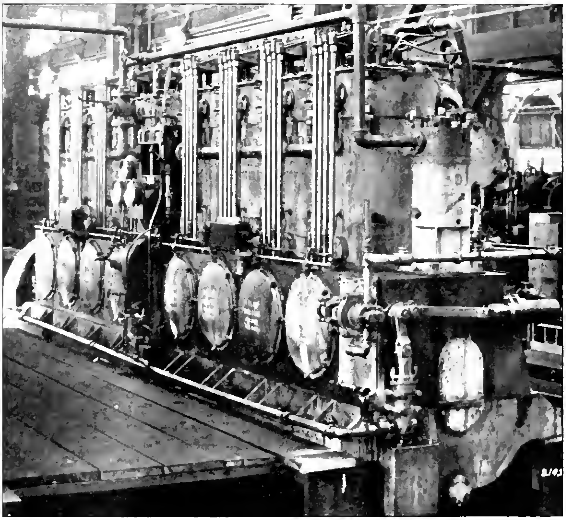
Whether the results of competition among steamship companies or, which is more probable, because of the very rapid growth in the demand for luxury particularly found among the traveling public of the United States, both bath steward and staterooms with berths are growing steadily scarcer. And the surprising thing to the traveler from the east is that the Pacific should offer a higher general standard of luxury than is found in Atlantic travel.

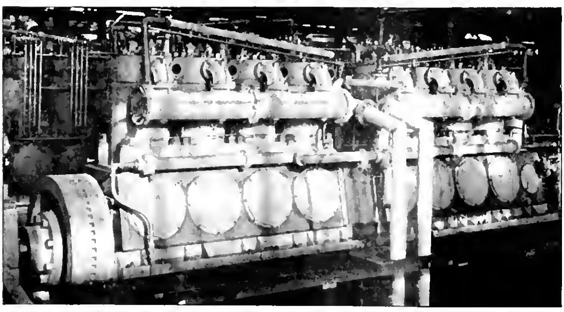
Steadily the luxuries of yesterday are becoming the necessities of today and against the weight of argument of those who are offering Atlantic travel, the steamship operators of the Pacific are providing exceptional ocean travel luxuries plus the lure of the ports and countries to which they run.

The appeal of the southern route by Lassco liners from Los Angeles to Hawaii has drawn an increasing patronage because of the smoothness of the particular lane of travel from this port and because in the design, furnishings, and service, especially of the two larger liners of the Lassco fleet, every effort has been made by the management to provide the maximum of luxury possible.

With every room on the outside and all equipped with beds, the City of Honolulu now in this service for eighteen months has approximately seventy per cent of her staterooms either with private or connecting bath. The percentage of baths to staterooms on the companion luxury liner, City of Los Angeles, the flagship of the fleet, was not as high until last month when, following her return from the cruise around South America, some further improvements were made in the passenger quarters of C deck. The remodeling consisted of replacing a block of twenty two and three-berth staterooms with fourteen rooms with private bath and two groups of two rooms each having a bath communicating. These new rooms are all outside and have been furnished with beds and the latest stateroom conveniences.

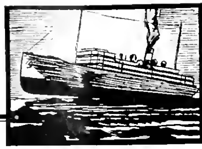
On the City of Los Angeles approximately sixty-three per cent of the staterooms for first-class passengers now have either private or communicating bath.





LARGE ATLAS DIESELS

The two illustrations herewith were made recently in the shops of the Atlas-Imperial Diesel Engine Company, Oakland, California, and show a pair of 8-cylinder, 500-horsepower, Atlas-Imperial, stationary type, diesel engines to be installed in the new San Diego-Coronado diesel-electric automobile ferryboat now building at the Oakland plant of The Moore Dry Dock Co. Each of these engines will be direct-connected to a 325-kilowatt, Westinghouse generator.



Marine Insurance

Edited by JAMES A. QUINBY

On Deck Stowage Case Affirmed

OUR readers will recall that we had occasion in a recent issue to discuss the case of Davidson and Strauss vs. Flood Brothers (The Carisso) 1928 A.M.C. 993, holding that on deck stowage under a bill of lading clause permitting stowage on or under deck was not in conflict with the Harter Act, even though the nature of the goods made sea-water damage inevitable when they were stowed in an exposed position.

The Circuit Court of Appeals for the Ninth Circuit has now handed down a decision affirming Judge Kerrigan's holding in the District Court. The Appellate Court's opinion reads in part as follows:

"By the decree below appellants (libelants) were denied recovery for damage from sea water to certain shipments of cork-board carried on deck of appellees' motorship Carisso on a voyage from Lisbon to San Francisco. On-deck stowage was pursuant to a clause in the bills of lading granting appellees 'liberty to carry the goods and any other goods on deck or under deck.' And the evidence being that cork-board so carried is likely to be damaged to some extent by sea water, the sole question presented is whether the clause is within the denunciation of the Harter Act (27 Stat. 445) which in Section 1 declares that it shall not be lawful for the carrier to insert in any bill of lading any provision by which it 'shall be relieved from liability for loss or damage arising from negligence, fault, or failure in proper loading, stowage, custody, care, or proper delivery of all or any lawful merchandise or property committed' to its charge.

"It is not seriously contended that if the right to carry cork-board on deck at all be granted the consignments here were improperly loaded or stored, but only that it was negligence 'per se' to carry them on deck instead of under deck. The implications of the statement in appellants' brief characterizing the language quoted from the bill of lading as a 'printed catch-all clause' are rebutted by certain circumstances which would seem to have little, if any, bearing on the main question and are referred to only because of such characterization. At the trial appellants admitted that on two prior occasions they had given the appellees permission to carry cork-board on deck; that in respect to such shipments the understanding was that appellees were to pay the extra cost of insurance; that in the instant case appellants received the bills of lading prior to the arrivals of the goods; that on such arrival they took no exception to the condition of the goods though they had knowledge that they had been carried on deck and the stain of sea water was plainly visible on the outside of the crates; and that they notified appellees that they would have to pay the extra insurance for on-deck carriage."

When does lumber cease to be lumber?

No Distinction for Goods Properly on Deck

It is to be noted that appellants concede that the inhibitions of the Harter Act are not of universal application. They say:

"We must also remember that a stipulation permitting the carriage of goods on deck is not invalid per se. If it is proper, from the nature of the goods (like lumber, for instance), to ship on deck, then such carriage is proper and, under Section 3 of the Harter Act, a shipowner will be excused for loss or damage caused by perils of the sea or faults or errors in navigation.

If, however, the goods, from their nature, cannot safely be carried on deck, then a stipulation for such carriage would seem invalid under American law."

But if the goods can be "safely" carried on deck the shipper's consent would be wholly needless. And if the shipper may, notwithstanding the Harter Act, lawfully stipulate that his lumber may be carried on deck, for what reason is he to be prohibited from making a similar stipulation respecting his cork-board? Some kinds of lumber may suffer less injury than cork-board from salt water and exposure to the weather, but other species, it is imaginable, may suffer more. Where is the line to be drawn and how are the courts to draw it? It is not a question of compelling a shipper to assume a peril in order to obtain the carriage of his goods. Two modes are offered him, the one safer than the other, and presumably more expensive. He may have either at his option. Nor is it a question of relieving the carrier from the consequences of its negligence; it must exercise all reasonable care in either case.

Coincidence

Now the Dunkirk Belle and the Empress of Rome
  Piled up, bows-on, in the fog,
And each of the two when the case was tried
  Produced the skipper's log.
The logs were true, the captains swore
  With earnest emphasis—
But I do not see how that could be,
  For each of them read like this:

"When first we sighted the other ship
  She was steaming to beat the band,
And she gave us a blast for a port to port,
  Then crossed to our starboard hand.
She had no lookout on the foc's'l head,
  No warning signal we heard—
(Our ship, you will learn, was proceeding astern
  When the accident occurred.)"

J. A. Q.

In terms at least the Harter Act does not prohibit such a stipulation and, "Stipulations not covered by the terms of the statute which were valid under American law before the Act were unaffected by it" (Hughes, Admiralty (2nd) page 9.) In Lawrence v. Minturn, 58 U.S. 100, it is said:

"The maritime codes and writers have recognized the distinction between cargo placed on deck with the consent of the shipper, and cargo under deck. There is not one of them which gives a recourse against the master, the vessel, or the owners if the property lost had been placed on deck with the consent of its owner."

The Appellants are filing a petition for certiorari to the Supreme Court of the United States.

With Our Friends in London

WE acknowledge the kindness of The Institute of London Underwriters in sending us the notice of recent elections in that body, together with the retiring chairman's report and the Executive Committee's annual report for the year 1928.

G. A. T. Darby, manager of the Marine Insurance Company, Ltd., and G. G. Sharman, underwriter for the World Marine & General Insurance Company, were unanimously elected Chairman and Deputy Chairman, respectively, for the ensuing year.

The Committee recommends a slight change in the Institute Theft and Pilferage Clause to read as follows:

> (a) It is hereby agreed that this Policy covers the risk of Theft and/or Pilferage irrespective of percentage but Underwriters' liability in respect of any goods so lost not to exceed their shipping or insured value whichever is the smaller. No liability for loss to attach hereto unless notice of survey has been given to Underwriters' Agents within 10 days of the expiry of risk under the Policy.
>
> (b) It is hereby agreed that this Policy covers the risk of Non-Delivery of an entire package for which the liability of the Shipowner or other Carrier is limited, reduced or negatived by the Contract of Carriage by reason of the value of the goods but Underwriters liability in respect of any goods so lost not to exceed their shipping or insured value whichever is the smaller.
>
> "Shipping value" as used above means the prime cost of the goods to the Assured by whom or on whose behalf the insurance is effected plus the expenses of and incidental to shipping and the charges of insurance.
>
> Underwriters to be entitled to any amount recovered from the Carriers or others in respect of such losses (less cost of recovery if any) up to the amount paid by them in respect of the loss.

It will be noted that the term "prime cost," with its attendant difficulties, is retained.

Hull Business Improved

Hugh Merriman, the retiring chairman, comments on Hull Underwriting as follows:

"The agreement to 'respect the lead' has been faithfully maintained, thanks to the loyal support of both Company and Lloyd's Underwriters, and the market during the past year has shown a steady improvement in hull rates. In this latter connection the outstanding event of the year on the hull side of the business was undoubtedly the agreement come to in May last to increase all rates on renewal by a minimum of 10 percent, which agreement as you will remember applies to vessels of all flags except only yachts and building risks, and to all insurances other than those effected on 'Total Loss Only' conditions.

"This agreement was welcomed abroad and much appreciation was expressed that the increase should be applied to all flags, thus avoiding any invidious distinctions.

"Not only was general approval of this agreement expressed in underwriting circles, but little criticism was forthcoming from shipowners, and doubtless the reason for this is that, as everyone engaged in the business must know, the increase in rates was justified, for there is not the least doubt that for many years shipowners have been buying their insurance below cost. Before Underwriters will be able to make a reasonable profit out of hull insurances rates will still have to be increased owing to the high cost of repairs as compared with pre-war years, a factor that is too often overlooked."

In his reference to the cargo situation, Mr. Merriman's reasons for his slight vein of pessimism contain a note of encouragement for non-British Underwriters.

"**Cargo Business.** It is now that I come to the less hopeful side of the business and the reasons for the pessimistic outlook referred to in my earlier remarks.

"When advising you last year in regard to the steps that were being taken for the betterment of the business I said I was not too sanguine as to the results owing to the lack of co-operation by the market as a whole. My prophecy has come true as the past twelve months have been a keen disappointment to those of us who looked for a general improvement following the discussions at and subsequent to the meeting in July,

1927. Attempts have been made to obtain tariffs and agreements, but generally speaking these have been abortive, and as far as one can ascertain the reason is that whereas in years gone by it was possible to maintain a tariff signed only in the United Kingdom it is now impossible to uphold a tariff unless the same is made international.

"Then again there is the evil of reinsurance abuses, and many of us hold the view that this is the crux of the present deplorable state into which our business has drifted. Reinsurance is of course absolutely necessary within moderation, as for example reinsurance to relieve an underwriter of a percentage of his Company's aggregate line on any particular interest, which has accumulated through say lines being accepted not only through Head Offices but by agencies, but the great evil is that of reinsurance treaties bearing commission on premium, that is to say reinsuring with the sole object of obtaining a profit.

"Before concluding my remarks in connection with cargo business I wish to submit to you for your consideration during the ensuing year a suggestion which to my mind can but be beneficial to the business, and that is that, insofar as the risk of fire is concerned, marine underwriters should refrain from extending the cover afforded by the Warehouse to Warehouse clause, except of course in exceptional circumstances such as frozen meat insurances where the insurance is governed by special clauses. In short, the marine underwriter should only cover the risk of fire when the goods are in the ordinary course of transit and immediately the goods have arrived at their destination the risk of fire should cease to be covered by the marine policy."

In the light of recent American cases, including Lindo vs. Ocean Marine Isurance Co., the above comment on the Warehouse to Warehouse clause is interesting in its apparent attitude toward extinction of the time element in the coverage.

Underwriters Annual Banquet

THE Association of Marine Underwriters of San Francisco held its annual business meeting and banquet on Saturday, January 26. Thomas K. Hannum of The Insurance Company of North America was elected president of the organization for the coming year. Frank A. Jansen, formerly of Parrott & Co., but now with Mathews & Livingston, received the office of vice-president; and Walter L. Dawes was re-elected secretary-treasurer. The executive committee for 1929 will consist of E. F. King, Ray Mitchell, and George H. Ismon.

New members elected at the annual meeting were: Joseph Sharp, W. R. Arnold, Paul A. Pier, and R. Bruce Miller.

The banquet took place in the evening at the San Francisco Commercial Club and lived up to the high standard set for these events during the last few years. The feature of the occasion was a speech on "P. & I. Insurance," by "Sir Wilfrid Eustace Holbrook," a visiting English insurance luminary, who was supposed to be a president or something or other and chairman of this and that in dear old London. It turned out that the visitor was a local product enacting a part for the occasion, but the expose did not occur until several of the members of the association had almost come to blows over the comparison of British and American methods as set forth by the speaker.

As an aftermath of the hoax individual members are recalling bits of conversation which took place between their associates and "Sir Wilfrid Eustace Holbrook." Several of the banqueters held long and intimate discussions with the speaker in regard to mutual friends in London, and one local manager of a British Company assured "Sir Wilfrid" that the latter's career was well-known to him, which was a dead give-away, inasmuch as the name used by the speaker was purely imaginary.

Recoveries From Carriers in England

AMERICAN underwriters are so accustomed to regard their recoveries from carriers as an ordinary means of reducing their loss ratio that we read with some surprise in the December 27 issue of "Fairplay" that British insurers are not yet fully alive to the benefits which have been conferred upon them by "The Carriage of Goods by Sea Act." Fairplay's comment is in the form of an editorial, and it points out that the underwriters are very apathetic concerning their rights and very casual in proceeding against the shipowner after settling losses for which the latter may be held liable.

The historical reason for this apathy is quite apparent. England has for centuries been a shipowning country, with the major part of her capital invested in vehicles of ocean transportation. Her legislation and the decisions of her courts have revealed the sympathy for the shipowning class. Until the adoption of the Carriage of Goods by Sea Act, the liability of British shipowners for damage to cargo was ex-

tremely limited. Unless his vessel happened to come within the tenor of the Harter Act, he was enabled by the insertion of appropriate clauses in his contract of carriage to protect himself from almost any type of liability, including that directly due to negligence in stowage. Under the Carriage of Goods by Sea Act, however, the cargo owner (and consequently the cargo insurer) has acquired the right of legal redress against the shipowner in substantially the same degree as that afforded in America by the Harter Act.

It is interesting to note that Fairplay believes the success of American underwriters in making such recoveries has been due entirely to the existence of organizations which make a specialty of protecting the cargo insurers' interests in this country. "Even in such cases," remarks the article, "it is rare for underwriters to obtain a full recovery of the amount due to them, the usual procedure being to negotiate a compromise at the last moment. What is required, therefore, is some machinery capable of relieving underwriters of the trouble and expense of fulfilling these two conditions and able to negotiate with the clubs on equal terms . A great deal of this machinery is already in existence as separate units, but, until it is co-ordinated, there is not much prospect of the Carriage of Goods by Sea Act proving to be half as effective to British underwriters as the Harter Act is to their contemporaries in the United States."

MIXED CARGO

A San Francisco shipowner told us a good story recently which throws some light on the attitude of the old time skipper toward personal injury claims.

It seems that the owner had been sued by two stevedores who had received injuries on one of his vessels. Although the alleged injuries had taken place some three months previous, the owner had received no report of the incident from his master. He called the master—an old-time sea dog—on the carpet, and the following dialogue took place:

"See here, Captain, I had no report of this accident. How come?"

"Oh, those bohunks weren't hurt any."

"Well, never mind; hereafter I want a report even if a man gets a splinter in his hand."

"Well, then, I suppose if that's the way you feel I ought to tell you about that stevedore down at Orleans two months ago. He fell down the hatch and broke his neck."

"Great Scott (or shipowners' language to that effect), what did you do with him?"

"Oh, we gave him to the police and they buried him."

The eighth meeting of the Marine Insurance Study Class of the Association of Marine Underwriters of San Francisco was held on January 14, the members listening to addresses by M. R. Obitz, F. S. Hough, and E. B. Egbert.

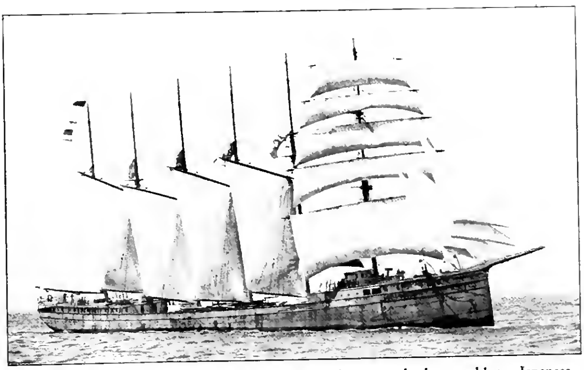
Mr. Obitz, assistant sales manager of the Western Sugar Refinery, took his hearers on a verbal jaunt which followed the production and refining of sugar from the time it was planted until final distribution of the finished product. His remarks were accompanied by photographs and samples which furnished a clear idea of the distinction between the various types and grades of sugar.

Messrs. Hough and Egbert, assisted by a reel of motion pictures, offered a graphic portrayal of the use of the Lux system for extinguishing fires afloat and ashore. The underwriting members of the class evinced great interest in the efficiency of this apparatus for the application of carbon dioxide for extinguishing oil fires and conflagrations aboard ship.

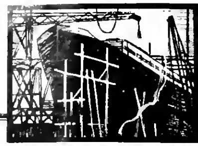
The ninth meeting of the Marine Insurance Study Class took place on January 28, at which time Golden W. Bell, well-known San Francisco admiralty attorney, addressed the members on the "Law of Salvage."

Mr. Bell discussed the need for immediate and skillful effort in saving life and property at sea as the basis for relatively large awards heretofore made by our courts in this connection. He went on to point out the elements on which salvage awards are based; i.e., danger to salved vessel, danger to salving vessel, values involved on both sides, risk of life, etc.

There was considerable discussion from the floor as to the relation between salvage charges and general average, together with general interest as to the possible bearing that salvage values may have had in the Vestris case.



The barkentine City of Sydney, pictured above, has recently been sold to Japanese interests for scrapping and is on her way across the Pacific with lumber. Formerly the Pacific Mail steamer City of Sydney, she was a prime favorite on the transpacific run. She was built by John Roach of Chester in 1875, single screw, powered with a compound 51 x 88 x 60-in. engine and six Scotch boilers carrying steam at 80 pounds. Her iron hull is still in very good condition.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Some Recent Shipbuilding Orders

J. C. Johnson's Shipyard, Port Blakely, Wash., has an order from P. E. Harris & Company, Seattle, for a 76ft. cannery tender and for two 60x16ft. fish scows; also an order from the Pioneer Sand & Gravel Co., Seattle, for a scow 130x38x11ft.

Great Lakes Engineering Works, River Rouge, Mich, has an order from the Pittsburgh Steamship Company for a bulk freight carrier 580 L.B.P.; 60 beam; 19 loaded draft; 12 miles speed and 12,000 gross tons. The vessel is to be powered with triple expansion steam engines developing 2200 indicated horsepower, steam to be supplied by two Babcock & Wilcox water-tube boilers. Keel is to be laid about March 15.

Defoe Boat & Motor Works, Bay City, Mich., has an order from K. T. Keller of Detroit for a wood yacht 83 L.B.P., 15 ft. 6ins. beam, 4ft. 6ins. loaded draft; 12 miles an hour speed; to be powered by 300 indicated horsepower Winton diesel engine. Keel is to be laid about February 15.

Lake Washington Shipyards, Houghton, Wash., has an order from the Northern Transportation Co., Seattle, for a diesel powered pass. & freight vessel 186ft. long, 35 ft. beam, to be powered with two 550-horsepower Washington-Estep diesel engines.

This yard also has an order for a wooden cannery tender for Libby, McNeill & Libby, Seattle, to be 65ft. long, powered with one 110-horsepower Washington-Estep diesel engine, and six fish scows.

American Bridge Company, Pittsburgh, Penn., has an order from the West Kentucky Coal Co. for 8 coal barges 175x26x11ft.; also order from U.S. Engineers, Rock Island, for twenty deck barges 108x24x5ft.

Bath Iron Works, Bath, Maine, has received an order from Henry Gielow, Inc., New York, for a twin screw steel.. turbo-electric yacht (Corsair), for J. P. Morgan, 343 by 42 by 27 ft. draft; 6000 shaft horsepower; General Electric turbo-generators; Babcock and Wilcox boilers.

This yard also has an order for a 36ft. steel utility boat for Brown & Co., to be powered by a 40-horsepower Bolinder eng.; delivery March 15.

Federal Shipbuilding & Drydock Co., Kearny, N.J., has an order from Gahagan Construction Co. for a dredge hull, 160x40x13ft. 6in.

American Ship Building Co., Cleveland, has an order from the Pittsburgh Steamship Co. for two bulk freight carriers to be 580 L.B.P.; 60 beam; 19 loaded draft; 12 miles speed; to be powered by triple expansion steam engines developing 2200 indicated horsepower; steam to be supplied by three Scotch boilers 14x12 ft.

Nashville Bridge Co., Nashville, Tenn., has booked orders for 2 deck barges 100x24x5 ft.; two 75x20x 5 ft.; one 120 x 30 x 6 ft.; and one 110 x 28 x 7¼ ft.

The Charles Ward Engineering Works, Charleston, West Va., has an order from the U.S. Engineers Office, Memphis, for two mooring and fascine barges 250x26x7 ft.

This yard is also building a new tugboat to replace the Captain George, which was completed, ready for trials and delivery, and destroyed by a natural gas explosion January 9. The tugboat will be single screw, 65ft. 6in. x 17ft. x 7ft. 7½ inches; 190 B.H.P. Winton diesel engine.

Collingwood Shipyards, Ltd., Collingwood, Ontario, is building a triple expansion steam engine to develop 6500 indicated horsepower; steam being supplied by six Scotch marine boilers 15ft. 6in. diameter. The machinery is to be installed in the ice-breaking vessel now building for the Department of Marine and Fisheries of Canada at the plant of the Halifax Shipyards, Ltd.

George Wrang, Bellingham, Washington, has an order from U.S. Bureau of Fisheries for a 50-foot patrol boat for Yukon patrol.

Bethlehem Shipbuilding Corporation, Ltd., Bethlehem, Penn., has an order for the Seaboard Shipping Company, 17 Battery Place, New York, for a diesel engined oil barge.

This yard also has an order from the Western Maryland Railroad for three two-track steel carfloats 190x 35x9ft.; also an order from the Erie Railroad for three three-track steel carfloats, 225 by 38ft. 6in. by 10ft. 8in.

The Western Boat Building Co., Tacoma, Wash., has an order from H. C. Hanson, Seattle naval architect, for two cannery tenders for the Northwestern Fisheries Co.; 83 x19x8ft. 6in.; 10 knots speed; powered with 200-horsepower diesel engines; to cost $40,000 each.

Mojean & Ericson, Tacoma, have an order from H. C. Hanson, Seattle naval architect, for a tugboat for the Northwestern Fisheries Co., 80 x18x6ft.; powered with 200 horsepower diesel eng.; to cost $35,000.

Campbell Machine Company, San Diego, has orders from Manuel Freitas and Joaquin Medina & Co. of San Pedro, California, for two wooden tuna fishing boats of 120ft. over-all, 27 beam, 11ft. 6in. depth, to be powered with 400 H.P. Union diesel engs.; York refrigerating machine; Westinghouse motors.

J. M. Densmore Company, Quincy, Mass., has an order for a motor yacht which will be 120 feet long, 20 feet 6 inches beam, 7 feet draft, and will be powered by two-300-horsepower Winton diesel engines.

Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa., has an order from the Seaboard Shipping Co., New York, for a self-propelled, diesel-powered oil tank barge.

The construction of a dry-dock to accommodate vessels of large tonnage, with the necessary complement of machine and repair shops, to cost in the neighborhood of $1,000,000 is reported to be planned by the Tampa Shipbuilding & Engineering Co. of Tampa, Florida.

Shipbuilding Work in Prospect

Dollar Line Asks Bids On Ship Construction

Bids have been asked by R. Stanley Dollar, general manager of the Dollar Steamship Company, San Francisco, for the construction of one and possibly two liners for transpacific service of the Dollar Line, to be built under the provisions of the Merchant Marine Act, 1928, and to cost in the neighborhood of $7,000,000 each.

President Signs Cruiser Bill

The Naval Construction Bill providing for the construction of 15 light cruisers and one aircraft carrier within the next three years at an estimated cost of $274,000,000 was recently passed by both houses of Congress and has been signed by the President, making it law. The Act carries with it the amendment providing that the first and each succeeding alternative cruiser shall be constructed in a government navy yard. The Act provides for the placing of orders for five cruisers during each of the fiscal years ending June 30, 1929, 1930, and 1931.

The Senate is considering an appropriation bill providing $12,370,000 for the first two years' program and to make $700,000 available immediately for the start of work on the first five cruisers.

The Act carries a clause providing that in the event of an international agreement for the further limitation of naval armament, to which the United States is signatory, the President is authorized and empowered to suspend in whole or in part any of the naval construction authorized under this Act.

Bids Opened In Seattle for Steel Fishing Boat

W. C. Nickum, Seattle naval architect, has received bids from Seattle and Portland shipbuilders for the construction of a diesel-powered steel fishing boat for a Seattle owner. The vessel will be 125 feet long, 26 feet beam, and 9 feet depth, powered with a 375 horsepower diesel engine. She will have cold storage space for 250 tons of fish.

Calmar Line May Build Four Freighters

Officials of the Union Plant, Bethlehem Shipbuilding Corp., Ltd., refuse to discuss or confirm the report that the Calmar Line, a subsidiary of the Bethlehem Steel Company, is planning the construction of four 20-knot, 12,500-D.W.T. cargo carriers for the intercoastal trade. The report as published in the daily press states that four vessels will be build at the San Francisco plant of the Bethlehem Shipbuilding Co. and will cost $2,750,000 each.

Bids Called on Matson Liners

Plans and specifications for the two high speed transpacific passenger and cargo liners for the Matson Navigation Company of San Francisco have been issued to shipyards and machinery manufacturers, who are now conferring with the owners preparatory to submitting bids.

The two vessels will be twin-screw, geared turbine drive, with a maximum horsepower of 25,000 with boiler pressure at 360 pounds. It is required that these vessels develop a sustained speed of 20 knots. All auxiliaries are to be electrically operated, the electric generators for developing this power to aggregate about 2000 horsepower.

The vessels will be 625 feet long, 77 feet 6 inches beam, and of 26,000 tons displacement. Accommodations are to be provided for 700 passengers.

Schooner Yacht to be Built

Bids have been asked from shipyards on the Pacific Coast for the building of a 95-foot diesel auxiliary powered schooner yacht designed by C. Padgett Hodson, Kohl Building, San Francisco, for a San Francisco yachtsman. This boat is to have a beam of 23 feet 3 inches and draft of 10 feet 6 inches, and is to be built to Lloyd's A-1 rating for seagoing schooner.

New Machinery to be Placed in Freighters

The Shipping Board recently sold the steamers John Jay, James Otis, and Terre Haute to Robert W. Malone of Washington, the vessels to be operated in tramp service by a new corporation to be formed by Mr. Malone with New York and Boston associates.

Under terms of sale the purchaser agrees to replace the present propelling machinery of the three vessels with either reciprocating engines or diesel engines. New propellers will also be placed on the vessels.

Large Reconditioning Job in Prospect

On January 29 the Shipping Board approved the sale of the steamship Oakhurst, of 9400 tons deadweight, to Leathem Smith-Nacco Steamship Lines, Inc., Norfolk. The sale was for $35,000 cash, with the understanding that the vessel be converted into a self-discharging collier with engines located aft; work to cost not less than $450,000.

Bids Opened February 21 for Coast Guard Cutters

The date for opening of bids for the construction of three Coast Guard cutters has been changed from March 12 to February 21, and tenders are to be opened at the office of the U.S. Coast Guard, 14th and E Streets, N.W., Washington, D.C.

These cutters are to be similar to those recently completed by the Fore River Plant of the Bethlehem Shipbuilding Corp. They are to be of steel hull construction, 250 ft. long, 42 ft. molded beam, 2000 tons displacement on 15 ft. draft, and to have turbo-electric machinery developing 3220 shaft horsepower.

Award of Contract for Seattle Ferryboat Undecided

Announcement of contract award for the construction of a 200-foot, diesel powered ferryboat for the Kitsap County Transportation Co., Seattle, has not been made. Bids were opened January 21, and the estimated cost of the vessel is $200,000.

Side-Wheel, Diesel-Powered, River Boat Planned

It is reported to us that J. Howard of the Howard Shipyards and Dock Company is drawing up plans for the construction of a 200-foot, steel hull, side-wheel, river packet to be powered with diesel engines.

Shipping Board Accepts Chapman Bids for Atlantic Lines

The United States Shipping Board Merchant Fleet Corporation, on a bid of $16,300,000, sold to P. W. Chapman, Inc., investment banker of New York, the United States Lines and the American Merchant Line, including leaseholds of the two lines in connection with their operating terminals.

The new owners of the United States Lines agree to add new tonnage to the fleet, including two vessels of at least 45,000 tons each, construction of which will be started within two years.

Extensive Shipbuilding Plans for Canadian Terminal System

According to authorative reports, the Canadian Terminal System, Ltd., Toronto, Ontario, is preparing designs for 18 ships for operation on the Great Lakes. Six of these are for operation on the upper lakes and are to be of the largest and most modern type. The twelve others will be canal size ships for the lower lakes trade and will probably be built in British yards. It is reported that the six large freighters will probably be bid for by the yards at Midland, Collingwood, and Port Arthur, Ontario.

Bids For Los Angeles Pilot Boat Rejected

All bids for the construction of a pilot boat for Los Angeles harbor were rejected by the Board of Harbor Commissions, and Harbor Engineer George Nicholson has been authorized to draw up plans for specified type on which bids will be asked. In the bids rejected, the Harbor Board had requested the yards to specify type and machinery—but the range in cost and designs was so great that a decision was difficult, the bids ranging from $17,000 to $40,000.

News from the Shipyards

REPAIR AWARDS

Bethlehem Shipbuilding Corp., Ltd., San Francisco, has been awarded an important contract by the Dollar Steamship Company. This is for the rebuilding of the passenger accommodations on the round-the-world liner President Adams at a cost of $500,000.

In addition to this work, damage repairs to the vessel will be done at the same time, and these will be done at a cost of $339,850. The vessel's bottom was badly damaged when she grounded near the eastern entrance to the Panama Canal and close to 200 plates will be removed and repaired. Her propelling machinery was also damaged.

In rebuilding the ship's passenger accommodations, the passenger carrying capacity will be considerably increased and she will be made to conform to the company's liner President Polk.

Other bids submitted for the repair work on the President Adams were submitted by Todd Dry Docks, Inc., $353,000 and 87 days, and Moore Dry Dock Co., $368,251 and 92 days.

Johnson Drydock Company, New Orleans, was awarded contract for repairs to the steamer Hutchinson.

Bids for the reconditioning of the steamship Hutchinson which was recently purchased from the Shipping Board by the McCormick Steamship Company, were submitted by San Francisco shipyards. Alternative bids based on steel and wooden masts were submitted as follows:

United Engineering Co., $26,670, $17,950; Bethlehem Shipbuilding Corp., $26,290, $19,289; Moore Dry Dock Co., $31,776, $22,550; General Engineering & Drydock Co., $32,500, $25,550. It is reported that the New Orleans yard submitted a price about $3000 lower than the United Engineering Co.

Bethlehem Shipbuilding Corp., San Francisco, was low bidder February 18 for repairs to the U.S.A. transport U.S. Grant. Bids submitted by San Francisco Bay shipyards were as follows:

Bethlehem, $55,897; United Engineering Co., $57,201; Moore Dry Dock Co., $58,329; General Engineering & Drydock Co., $61,965.

KEEL LAYINGS

Copello, halibut fishing boat for Dan Larsen by Prince Rupert Drydock & Shipyard, Prince Rupert, Jan. 9.

No. 116, diesel-electric lightship for U.S. Dept. of Commerce, by Charleston Drydock & Machinery Co., Feb. 6.

Olive K., steel yacht for C. F. Kettering, Detroit, by Defoe Boat & Motor Works, Jan. 15; Verona J., wood yacht for Albert A. Rose, Detroit, Jan. 5.

Steam towboat for Wheeling Steel Corp. by Howard Shipyards & Dock Co., Jan. 10.

Santa Clara, passenger and cargo steamer for W. R. Grace & Co., by New York Shipbuilding Co., Feb. 4.

Oil tanker for Tide Water Oil Co. by The Pusey & Jones Corp., Jan. 12.

LAUNCHINGS

Lighter for J. W. Sullivan Co. by Federal Shipbuilding & Drydock Co., Jan. 19; steel barge for Boston Molasses Co., Jan. 29.

Dredge hull for M. H. Treadwell by Midland Barge Co.

Towboat for Standard Unit Nav. Co., by Nashville Bridge Co., Feb. 1; three barges and one dredge hull for stock.

Acania, diesel yacht for Arthur E. Wheeler by The Pusey & Jones Corp., Jan. 26.

Salt Lake City, 10,000-ton cruiser for U.S. Navy by New York Shipbuilding Company, Jan. 23.

DELIVERIES

Steel carfloat to Atchison, Topeka & Santa Fe Railway by The Moore Dry Dock Co., Jan. 10.

Three barges to Crucible Fuel Co. by American Bridge Co., in January.

Shipping Board to Sell Laid-Up Fleet

The Shipping Board, on February 12, authorized the sale of 253 vessels comprising all the vessels of the laid-up fleet except those required as reserve ships of the Shipping Board operations. The vessels are largely of the oil-burning, steel, cargo type, suitable for ocean service after overhauling the repairs. This group does not include any of the "Laker" type vessels.

The Export Steamship Corporation of New York has purchased the steamship Waterbury from the Shipping Board at a price of $67,656, including repairs which the purchaser agrees to perform within six months. The vessel is a steel cargo ship of 8727 deadweight tons equipped with Westinghouse turbines and Babcock & Wilcox oil-burning boilers.

G. Bruce Newby, formerly naval architect for the Los Angeles Shipbuilding & Drydock Corporation, announces that he has opened offices at San Pedro, California, as a consulting naval architect and marine surveyor.

Mr. Newby is a well-qualified marine designer and practical shipbuilder of long experience. His advice and service should be of great benefit to the marine fraternity at Los Angeles harbor.

W. N. Agnew, general traffic manager of the **Worthington Pump and Machinery Corporation,** has been appointed assistant to the president and general traffic manager of that organization, with headquarters at the executive offices in New York.

Mr. Agnew has been connected with the Worthington organization for more than 25 years. He joined the staff of the old International Steam Pump Company as traffic manager in 1910 and in 1925 was made general traffic manager of the Worthington Pump and Machinery Corporation.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of February 1, 1929.

Pacific Coast

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length over-all; 30' beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28 est.

Hull No. 113, lightship, sister to above; keel Sept. 1/28 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BALLARD MARINE RAILWAY COMPANY,
Seattle, Washington

Mikimiki, hull J 91, tugboat for Young Brothers, Ltd., Honolulu; 115 L.B.P.; 28 beam; 12 draft; 11 knots speed; 1040 Fairbanks-Morse diesel engs.; keel Sept. 12/28; launched Jan. 15/29.

BETHLEHEM SHIPBUILDING CORPORATION, LTD,. UNION PLANT
Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Hualalai, hull 5336, passenger and freight steamer for Inter-Island Steam Navigation Co., Honolulu; 295 L.B.P.; 27'6" beam; 17'6" loaded draft; 15 knots speed; 1200 D.W.T.; steam turbines; 4000 S.H.P.; 4 W.T. boilers; keel Dec. 17/28.

Humuula, hull 5338, steel passenger and freight steamer for Inter-Island Steam Navigation Company, Honolulu, 1100 Gr. tons; keel Feb. 14/29 est.

Not named, hull 5339, twin screw diesel tug for Inter-Island Steam Navigation Co., Honolulu; 117 L.O.A.; 28 breadth, 16 depth.

Hull 5340, barge for Inter-Island Steam Nav. Co., Honolulu; keel Apr. 1/29 est.; launch May 9/29 est.

Hull 5341, barge for Martin Ship Service, San Francisco; launched Jan. 8/29; deliver Feb. 28/29 est.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A. Wanner.

Hull 19, tow barge for Standard Oil Co. (Calif.), San Francisco; 72 L.B.P.; 24' beam; 4' loaded draft; 100 D.W.T.

Not named, hull 20, fishing boat for A. Paladini, Inc., San Francisco; 65' L.O.A.; 16 beam; 6 loaded draft; 125 H.P. 5-cyl. Union diesel eng.; keel Oct. 19/28.

J. C. JOHNSON'S SHIPYARD
Port Blakley, Wash.

Scow for Harbor Lime & Cement Co., Roche Harbor, Wn., 100x36x9'6"; **delivered Oct. /28.**

One scow for Salmon Bay Sand & Gravel Co., Seattle; 100x36x10 ft.; delivered **Sept. 21/28.**

Cannery tender for P. E. Harris & Co., Seattle; 76 ft. long.

Scow for Pioneer Sand & Gravel Co., Seattle; 130x38x11 ft.

Two fish scows for P. E. Harris & Co., Seattle; 60 x 16 ft.

LAKE WASHINGTON SHIPYARDS.
Houghton, Wn.

Purchasing Agent: A. R. Van Sant.

Hulls 101 to 105 inc. six fish wooden scows. (Dup Hull 101).

Hull 106, wooden cannery tender for Libby, McNeil & Libby, Seattle; 65 ft. long; one 110-H.P. Washington-Estep diesel.

Foshay, hull 107, steel passenger and freight motorship for Northland Transportation Co., Seattle; 186x35 ft. beam; two 550-H.P. Washington-Estep diesel engs.

THE MOORE DRY DOCK CO.
Oakland, California.

Purchasing Agent: N. Levy.

One steel carfloat for Atchison, Topeka & Santa Fe Railway, San Francisco; 260 L.O.A.; 38' beam over all; 12'6" depth midships; capacity 14 80-ton cars; **launched Dec. 22/28; delivered Jan. 10/29.**

Not named, one steel, screw double-ended diesel-electric automobile ferryboat for San Diego and Coronado Ferry Co.; 190 L.O.A.; 43'6" breadth of hull at deck; 60' breadth over guards; 14'9" depth at sides, molded; 8'11" light draft, molded; keel Dec. 27/28; deliver Apr. 20/29 est.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

One steel car barge for Canadian National Railways, Vancouver, B.C.; 270 x 42 x 12' depth; keel Sept. 12/28; launched Dec. 27/28; deliver Feb. 28/29 est.

Copello I, hull 27, halibut fishing boat for Dan Larsen, 52 L.B.P.; 13 beam; 5'6" loaded draft; 50 B.H.P. Bolinder semi-diesel engs.; **keel Jan. 9/29;** launch Mar./29 est.; deliver Apr. /29 est.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 13/31 est.

Atlantic. Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

One acid barge for American Steel Wire Co.; 100x26x7 ft.

Twelve barges for Crucible Fuel Co., Pittsburgh; 175 x 26 x 11 ft.; **3 delivered.**

Eight coal barges for West Kentucky Coal Co.; 175 x 26 x 11 ft.

Twenty decked barges for U.S. Engineers, Rock Island; 108 x 24 x 5 ft.

AMERICAN SHIP BUILDING CO.,
Lorain, Ohio

Purchasing Agent: C. H. Hirsching.

Not named, hull 804, bulk cargo vessel for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12½ mi. speed; T.E. eng. 2200 I.H.P.; 3 Scotch boilers, 14 x 12 ft.; keel Feb. 25/29 est.; launch May 4/29 est.; deliver June 15/29 est.

Not named, hull 805, sister to above; keel Mar. 4/29 est.; launch May 18/29 est.; deliver June 22/29 est.

BATH IRON WORKS
Bath, Maine

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer; keel Dec. 3/28; launch Apr. 10/29 est.; deliver May 1/29 est.

Hi-Es-Maro, hull 123, twin screw steel diesel yacht, Henry J. Gielow, Inc., New York, designer; 266'x35'x22' depth; 14'6" draft; two 1200 B.H.P. Bessemer diesel engs.; keel Nov. 14/28; launch May 8/29 est., deliver July 15/29 est.

Corsair, hull 124, twin screw steel steam turbo-electric yacht; 343x42x27ft.; 18 ft. draft; 6000 S.H.P.; General Electric turbo-generators; Babcock & Wilcox boilers.

Not named, hull 125, steel utility boat for Brown Co.; 36ft. long, 40 H.P. Bolinder eng.; deliver Mar. 15/29 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Not named, Hull 1422, single-screw coal collier for Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Not named, hull H-1424, steel passenger and freight steamer for New England Steamship Co., 1800 gro. tons.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; Winton engs.; General Electric generators and motors; **keel Jan. 30/29.**

No. 116, same as above; **keel Feb. 6/29.**

No. 117, same as above; keel May 1/29 est.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2921, 106-ft. cruiser for L. M. Wainwright, Indianapolis; 2 Speedway diesels, 300 H.P. ea. at 700 r.p.m., wt. 7500 lbs.; deliver May/29 est.

Hull 2923, 66-ft. cruiser for J. McMillan, Detroit, Mich.; 2 170-H.P. Speedway engs.; deliver May /29 est.

Not named, hull 2925, 64-ft. cruiser for Rear Admiral L. M. Josepthals, New York; 2 170-H.P. Speedway engs.; deliver May/29 est.

Not named, hull 2926, 76-ft. cruiser for Adolph M. Dick, New York; 2 300-H.P. Speedway engs.; deliver June /29 est

Not named, hull 2927, 35-ft. fishing boat for Leon Goodman, Philadelphia; two 44-H.P. Speedway engs.; deliver June 1/29 est.

Hull 2928, 21-ft. coupe yacht tender for Arthur Wheeler, New York; 1-22-H.P. Speedway; deliver May 1/29 est.

Hull 1929, 16-ft. yacht tender for above, 1 Universal eng.

Not named, hull 2930, 106-ft. cruiser for W. C. Robinson, Pittsburgh; 2 Speedway diesel engs.; deliver May 15/29 est.

Hull 2931. 16 ft. yacht tender for above; 1 Universal eng

Not named. hull 2932, 50-ft. fishing boat for Caleb S. Bragg. New York; 2 170-H P. Speedway engs.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Yoreda. hull 131, steel yacht, for Aaron De Roy, Detroit: 105 L.B.P.; 17 beam; 6 loaded draft; 14 mil. loaded speed; 110 D.W.T.; 250 H P. diesel eng.; keel Aug. 1/28; launch May 1/29 est.; deliver June 1/29 est.

Bonny II. hull 132, wood yacht for C. W. Bonbright, Flint, Mich.; 61 L.B.P.; 13 beam; 4 loaded draft; 18 m.p.h.; 300 I.H P. gas eng.; keel Oct. 15/28; launch Apr. 15/29 est.; deliver May 1/2º est.

Olive K., hull 133, steel yacht for C. F. Kettering, Detroit; 169 L.B.P.; 26 beam; 12 loaded draft; 15 knots speed; 600 D.W T.; 1000 I H.P. diesel engs.; **keel Jan. 15 29**; launch July 1/29 est.; deliver Aug. 15/29 est.

Verona J. hull 134, wood yacht for Albert A. Rose. Detroit; 75'6"' I.H.P.; 14'6" beam; 14' loaded draft; 18 M.P.H.; 70 D.W.T.; 500 H.P. gas eng.; **keel Jan. 5/29**; launch and deliver May 1/29 est.

Not named. hull 135. wood yacht for K. T. Keller. Detroit: 83 L.B.P.; 15'6" beam: 4'6" loaded draft; 14 M.P.H. speed: 82 D.W.T.; 300 H.P. Winton diesel engs.; keel Feb. 15/29 est.; launch June 1/29 est.; delivery July 1/29 est.

DRAVO CONTRACTING COMPANY,
Pittsburg, Pa., and Wilmington, Del.

Hull 614. diesel engined towboat for stock: 125'6" x 26'6" x 5' 6".

Hulls 691-694 inc. four steel carfloats for New York Central Railroad Co.; 270x38 x 10'5"; 850 gro. tons ea.; **three delivered.**

Hulls 787, 788, two steel house barges for Merchants and Miners Transp. Co.; 120 x 30 x 7 ft.

Hulls 789. 790. 791, three standard barges for Ohio River Sand Co., Louisville, Ky.; 130 x 30 x 7'6".

Hulls 794-799 inc.; 6 standard barges for stock: 130x30x7'6".

Hulls 800 to 809 inc.; 10 standard barges for stock: 100 x 26 x 6'6".

Talcott. hull 810, steel hull dredge for U.S. Engineers Office, Washington. D.C.; 620 gr. tons.

Hulls 811-815 inc.; five steel dump scows for American Dredging Co., Philadelphia: 112 x 34 x 12 ft.

Hull 816. steel oil barge for American Dredging Co., Philadelphia: 100 x 34 x 10'3".

Hull 817. one welded steel barge for stock: 100 x 26 x 6'6".

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 105, oil barge for above; 146x34'8" x10'2¼" (welded barges).

Hull 106, lighter hull for J. W. Sullivan Co.; 121x32'6"x13'4½"; keel Nov. 15/28, **launched Jan. 19/29.**

Hull 107, welded steel barge for Boston Molasses Co.; 60x20'4¾"x7'6"; **launched Jan. 29/29.**

Hull 108, same as above.

Hull 109. dredge hull for Gahagan Const. Co., 160 x 40x13'6".

GREAT LAKES ENGINEERING WORKS,
River Rouge, Michigan

Not named. hull 269, bulk freighter for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12 mi. speed; 12,000 gr. tons; TE engs. 2250 I.H.P. 2 W.T. boilers; keel Mar. 15/29 est.; launch June 15/29 est.; delivery Aug. 1/29 est.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1659, steam towboat for Wheeling Steel Corp.; **keel Jan. 10/29.**

Hull 1660, lighthouse tender for U.S. Bureau of Lighthouses.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 244, diesel-electric dipper dredge for Great Lakes Dredge & Dock Co.. 156 L.B.P.; 43 beam; 10 ft. draft aft; keel Aug. 30/28; launched Dec. 18/28; deliver June 1/29 est.

Not named, hull 246, car ferry for Pere Marquette Railroad Co.; 368 L.B.P.; 57 beam; 17 loaded draft; 18 m. **speed; 2 turbines**; 3600 I.H.P. each; 4 Babcock & Wilcox W.T. boilers; keel Mar. 1/29 est.; launch July /29 est.

Not named, hull 247, carferry, sister to above; keel May 1/29 est.

MARIETTA MANUFACTURING COMPANY
Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Hull 235. sternwheel oil barge for Tropical Oil Co.; 203'x44'x5'6"; Marietta tamden comp. eng. 14"x28"x84"; keel Aug. 1/28; deliver Jan. 11/29 est.

MIDLAND BARGE COMPANY
Midland, Pa.

One dredge hull for M. H. Treadwell Co. of New York; 150'x70'x13'6'; **launched.**

Four barges for Pittsburgh Plate Glass Co., Pittsburgh; 135x26x10 ft.

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Not named, hull 23, single screw package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42'9" beam; 14' loaded draft; 12 mi. speed; 2200 D.W.T.; TE steam engs.; 1300 I.H.P.; 2 Scotch boilers, 14'6" dia. x 11' long; keel Dec. 4/28; launch Apr. 1/29 est.; deliver May 1/29 est.

Midland Prince, converted to self-unloader; deliver May 1/29 est.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Hull 149, towboat for Standard Unit Nav. Co.; 92x24x5 ft.; keel May 10/28; **launched Feb. 1/29.**

Hull 161, ferry hull for stock; 150 L. B.P.; 62 beam; 8 loaded draft; keel Sept. 16/28; launch Feb. 10/29 est.

Hull 166, dredge for stock; 80 L.B.P.; 36 beam; 6 loaded draft; keel Nov. 15/28; **launched.**

Hull 167, deck barge for stock; 110 x 28 x7'3"; keel Dec. 15/28; **launched.**

Hull 168, deck barge for stock; 110 x 28 x 7'3"; keel Dec. 15/28; **launched.**

W. W. Fischer, hull 169, diesel towboat for Central Sand Co.; 120x26x5½ ft.; 720 I.H.P.; keel Feb. 15/29 est.

Hull 170, deck barge, 110x28x7¼ ft.; keel Dec. 7/28; **launched.**

Hull 171, deck barge, 100x24x5 ft.; keel Dec. 12/28.

Hull 172, same as above.

Hull 173, deck barge, 100x26x6½ ft.; keel Dec. 18/28.

Hull 174, same as above; keel Jan. 10/29 est.

Hull 175, ferryboat, for Cheatham Co., Tenn.; gas. eng.; 60x18x2¼ ft.

Hull 176, barge, 100x26x6½ ft.; keel Dec. 20/28.

Hull 177, tug, 50x12 ft.; 150 H.P.

Hull 178, dredge, 100x36x8 ft.

Hulls 179-183 inc., 5 barges, 120x30x 7 ft.

Hull 184, deck barge; 180 x 40 x 9½ ft.

Hull 185, deck barge; 180 x 40 x 9½ ft.

Hull 186, deck barge; 180 x 40 x 9½ ft.

Hull 187, deck barge, 110 x 32 x 7¼ ft.

Hulls 188-189, two deck barges for stock; 100x24x5 ft.

Hulls 190-191, two deck barges for stock; 75x20x5 ft.

Hull 192, deck barge for stock; 120 x 30 x 6 ft.

Hull 193, deck barge for stock; 110 x 28 x 7¼ ft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Viking, hull 328, steel yacht for Geo. F. Baker, Jr., 272'1" L.O.A.; 36'6¾" beam; 18'6" depth; two turbine driven G.E. motors; 2 Babcock & Wilcox WT boilers; 1200 gross tons; 2600 S.H.P.; keel July 3/28; launched Dec. 15/28; deliver Apr. /29 est.

Pennsylvania, hull 329, 18 - knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Oct. 15/28.

President Johnson, ex-Manchuria, hull 330, reconditioning for Dollar Steamship Co., San Francisco; **deliver Jan. 19/29.**

City of Elwood, hull 331, diesel conversion for U.S. Shipping Board.

Ward, hull 332, diesel conversion for U.S. Shipping Board.

NEW YORK SHIPBUILDING CO.
Camden, N. J.

Purchasing Agent: J. W. Meeker.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; **launched Jan. 23/29**; deliver July 9/29 est.

Chester, light cruiser CL- 27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.

Santa Clara, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'9" beam; 37'5" depth; General Electric turbo-electric machinery; **keel Feb. 4/29.**

THE PUSEY & JONES CORP.,
Wilmington, Del.

Purchasing Agent: James Bradford.

Acania, hull 1038, twin screw diesel yacht for Arthur E. Wheeler, New York; 126 L.O.A.; 21'6" beam; 8'6" app. loaded draft; 2 250-B.H.P. diesel engs.; keel Oct. 18/28; **launched Jan. 26/29**; deliver April 15/29 est.

Not named, hull 1039, oil tanker for Tide Water Oil Co.; 225 L.B.P.; 44 beam; 15 6" loaded draft; 10½ knots speed; 2300 D.W.T.; diesel-electric power; 1000 I.H.P.; **keel Jan. 12/29.**

Not named, hull 1040, yacht for Fred J. Fisher, Detroit; 236 L.O.A.; 34 beam; 19 depth; 2 1100 H.P. diesel engs.; keel Feb. 12/29 est.

Not named, hull 1041, yacht for Alfred P. Sloan, Jr., New York; same as above; keel Feb. 12/29 est.

Not named, hull 1042, yacht for owner not named; same as above; keel Mar. 12/29 est.

THE SPEAR ENGINEERS, INC.,
Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

John M. Dennis, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Pair-

banks-Morse direct diesel drive; two 450-I.H.P. engs.; keel Feb. 18/28; launched Dec 15/28; deliver Mar. 15/29 est.

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor. keel Aug. 18/28.

Not named, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P., keel Jan. 15/29 est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Charles E. Evans, hull 264, fire and patrol boat for Commissioners, Washington, D.C.; 55' L.O.A.; 11'9" molded beam; 6'9" molded depth; 5' loaded draft; 31 D.W.T.; 100 H.P. Standard diesel eng.; keel Aug. 25/28; launched Nov. 22/28; deliver Feb. 1/29 est.

Not named, hull 265, steel hull, steam driven, patrol vessel for Supervisors of New York Harbor, 39 Whitehall Street, New York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam; 10'1½" mean draft; T. E. engs.; Babcock & Wilcox W.T. boilers.

STATEN ISLAND SHIPBUILDING CO.,
Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Dongan Hills, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp engs.; 4000 I.H.P.; W. T. boilers; keel July 2/28.

Hull 782, barge for Grasselli Chemical Co.; 150 x 38 x 12'6".

Pittsburg, hull 684, dredge hull for Atlantic, Gulf & Pacific Co.; 162 L.B.P.; 44 beam; 15 loaded draft.

SUN SHIPBUILDING COMPANY,
Chester, Penn.

Purchasing Agent: H. W. Scott.

Not named, hull 116, passenger and freight motorship for American South African Line, Inc., New York; 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs.; keel Mar. 14/29 est.

Not named, hull 117, tanker for Sun Oil Co.; 245 L.B.P.; 43 beam; 15'6" loaded draft; 8 knots speed; 2300 Bessemer diesel engs.

TODD DRYDOCK, ENGINEERING & REPAIR CORP.,
Brooklyn, N.Y.

Purchasing Agent. H. J. Shannan.

Not named, hull 45, steel double-end ferryboat for City of New York, Dept. of Plant and Structure; 151 L.O.A.; 53 beam over guards; 37'6" molded beam; depth to top of beams 14'3"; draft 8'3"; steam engs.; keel Nov. 1/28.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Dwight W. Davis, hull 69, steam propelled towing boat for Inland Waterways Corp., Washington, D.C.; 140x25x9 ft.; 2 500-H.P. Nordberg engs.; equipped to burn powdered coal, keel July 23/28; launch Feb. 9/29 est.; deliver Feb. 28/29 est.

Captain George, hull 73, single screw tugboat for U. S. Engineer Office, Galveston; 65'6"x17'x7'7½"; 190 B.H.P. Winton diesel eng.; keel Oct. 16/28; launched Dec. 28/28; deliver Jan. 5/29 est. (Note: Demolished by explosion before delivery. Rebuilt under Hull 79).

Tom Stallings, 74, Western river type, steam driven 30-ton snag boat for Memphis River and Harbor District, U.S. Army engineers; 127"x30'x4'4"; keel Nov. 27/28.

Hull 77, mooring and fascine barge for U.S. Engineering Office, Memphis; 250 x 26 x 7 ft.

Hull 78, same as above.

Captain George, hull 79, single screw tugboat for U.S. Engineers office, Galveston; 65'6"x17'x7'7½"; 190 B.H.P. Winton diesel eng.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD., Union Plant.

Drydock, clean, paint, misc. repairs: W. S. Rheem, Golden Mountain, Montezuma, W. S. Miller, Sonoma, Charles Christenson, tugs Arabs, F. A. Douty, Storm King, schr. H. W. Baxter, stmrs. Daisy Matthews, Crickett, San Diego, Whitney Olson, ferry City of Richmond, City of San Rafael, Barges Crowley No. 63, Raymond Nos. 4, S-1, S-3. Repair feed pump: Kiyo Maru, President Jackson. Cylinder repairs: m.s. Otokia. Telemotor repairs: Cathwood, Willpolo. Winch repair. Silveray. Pipe repairs: Zuiyo Maru, Trontolite. Propeller repairs: Point Fermin, Argyll, Alvarado. Tank repairs: Hallanger, Silveray. Misc. repairs: Mirrabooka, Varanger, Sea Witch, tug Sea Prince, s.s. Georgie, Kastalia, Caliche, Astral, San Felix, Melville Dollar, Lio, Henri Desmarais, Scottish Strath, Cricket, Warwick, West Mingo, Akera, La Brea, ferry Ramona, stmr. R. D. Leonard, Belgenland, Chehalis, Point Gorda, Argyll, San Mateo, Mongolia, Silverelm, Silveray, Maunawili, ferry Redwood Empire, Sacramento, J. C. Fitzsimmons, Richmond, Bolivar, Wilhelmina, Probitas, Point Reyes, Makura, Esparta, California, Sutorpco, W. H. Libby, Alvarado, La Perla, Lycia, Sinaloa, Huguenot, K. I. Luckenbach, whaler Hawk, stmr. Claremont, Knute Nelson, John C. Kirkpatrick.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

General repairs: stmr. Coldwater. misc. repairs to several minor vessels.

PRINCE RUPERT DRYDOCK & SHIPYARD,
Prince Rupert, B.C.

Dock, cleaned, painted, misc. hull and machinery repairs to 10 fishing boats. Misc. hull and engine repairs, not requiring docking, to 27 fishing boats. 78 commercial jobs.

TODD DRY DOCKS, INC.,
Seattle, Wn.

Docking, misc. repairs: stmrs. Charcas, Condor, Latouche (also cleaning), President Pierce, President Taft, Romulus, Texada. General overhaul: Dorothy Alexander. Voyage repairs: President Cleveland. Heavy weather damage: Starr. Engine room repairs. Hasshu Maru, Rhine Maru, Royal Star, Misc. repairs: Contra Costa, tug Iroquois, tanker Olympic.

U. S. NAVY YARD,
Bremerton, Wn.

Misc. repairs and docking: Colorado, New York, Somers, J. F. Burnes, dredge Culebra. Misc. repairs incident to operation as district craft: Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.

Who did What -- and How

If you want to meet a genial chief engineer drop down to pier 24 and have a chat with Gus Johnson, who has been aboard the coastwise carrier Mayfair as master of the propulsion department for the last nine months.

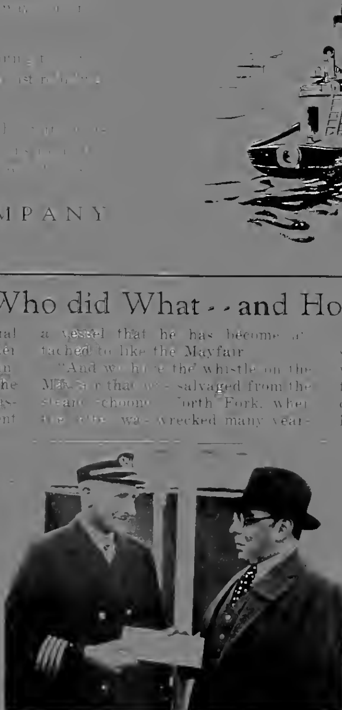
Born in Gothenburg, Sweden, Chief Johnson has been sailing the seas since 1884. His grandfather was skipper of an American bark for fifteen years until the vessel was lost on a trip from Philadelphia to Australia, with the loss of all on board.

The Chief was aboard the bark Star of Bengal when the craft was wrecked off Coronation Island in Alaskan waters in 1908, when one hundred and eleven men were lost and twenty-seven saved.

During the past fifteen years the Chief sailed aboard the steam schooners Daisy Freeman, San Antonio, Wilmington and Nan Smith as well as the lumber carrier Saginaw.

However, while the Mayfair was taking on a full cargo of Shell Oil for the voyage to Eureka and thence down to Port San Luis and back to San Francisco, the Chief stated that he has never sailed on a vessel that he has become attached to like the Mayfair.

"And we have the whistle on the Mayfair that was salvaged from the steam schooner North Fork when the latter was wrecked many years ago at Shelter Cove. The whistle was the only thing salvaged from the North Fork and it's the best whistle on any ship sailing the Pacific Coast," Engineer Johnson stated.



Captain Nils Carlson, Master S.S. "West Camargo" receiving from Juan Carlos Godav, Argentine General-Consul, the first official letter sent by Godav to his government to go direct to Argentina from the Pacific Coast.

Captain J. Jacobson, formerly a skipper on Swayne and Hoyt ships, will take command of the steel freighter Westhaven, recently purchased from the U.S. Shipping Board by the Lassco Line. The Westhaven will operate in the intercoastal service of the Arrow Line between Baltimore and Pacific Coast ports. Captain Jacobson takes charge of the vessel at Norfolk. She will load cargo at Baltimore and will leave on her first westbound vessel in the new service on March 28th.

The flagship of the Matson fleet "Malolo" will make a total of three special cruises this summer according to present plans. Probably the most important cruise will be that of the San Francisco Chamber of Commerce, primarily a good will tour, which will take a group of San Francisco business men around the Pacific on a 90-day voyage. The Malolo leaves on this cruise September 21 and the voyagers will return to the Golden Gate December 20 at which time the vessel will resume her regular schedule to Hawaii.

Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

Captain Horace F. Strothers, of Piedmont, California, was elected national president of the Masters, Mates and Pilots of America, January 25, 1929, at Washington, D.C., succeeding **Captain John W. Ponett** of Brooklyn, who had served twenty-one years as national president.

While in the East, Captain and Mrs. Strothers were guests of **Captain Ulster Davis** of Albany-Rensselaer district on an automobile trip over the famous Storm-King Highway through the highlands of the Hudson River.

Captain Alexander Swanson and Mrs. Swanson spent a few days with **Captain Allen A. Sawyer** and Mrs. Sawyer at Long Beach, California, on a recent trip to San Diego. It was the first time in eighteen years that Captain Swanson visited southern California.

D. J. Fraser, manager of the Burchard & Fisken offices at Portland, Oregon, has been elected president of the Portland Steamship Operators' Association to succeed **George Clarke. George Eggers**, operating manager of the States Steamship Company, has been elected vice-president; **Stanley Semple**, manager for the Yamashita Company, secretary-treasurer.

Matson Navigation Company and its agents, **Alexander and Baldwin, Ltd.**, have opened new offices in the ground floor of the Multnomah Hotel Building at Portland, Oregon, preparatory to the entrance of the steamer Wilhelmina into regular service between Portland, Seattle, and Hawaii.

The third annual Shipping Dinner of the **Maritime Association of Seattle** was held at the Olympic Hotel February 23, and was pronounced a great success by those who attended. Chairman of the arrangements committee was **Captain J. R. Jones**, marine superintendent at Seattle for the Standard Oil Company (Calif.). Other members of the committee were **Captain Cyril L. Meek**, Seattle district manager for the Transmarine Lines; **J. G. Eusen**, Northwest district manager for the Luckenbach Steamship Company; **Harrison J. Hart**, manager of the Drummond Lighterage Company; and **Jackson B. Corbet, Jr.**, publisher of the Marine Digest.

Delegates in attendance included not only shipping men of Seattle, but representatives from Tacoma, Olympia, Everett, Bellingham, Grays Harbor, Portland, Astoria, San Francisco, and other Pacific Coast ports.

Engineering staff of the Panama Pacific turbo-electric liner Virginia.

Standing, left to right: F. Koller, second refrigerating engineer; T. Robin, fourth assistant engineer; A. E. Menrath, chief electrician; J. S. Jones, chief refrigerating engineer; F. Schreck, third assistant engineer; V. A. Link, first assistant engineer; John Carstairs, chief engineer; P. J. Quinlan, first assistant engineer; H. N. Hall, second assistant engineer; J. Greig, first refrigerating engineer.

Kneeling, left to right: T. E. Brittingham, junior engineer; J. Maltman, junior engineer; M. Christy, junior engineer; J. McBride, junior engineer; E. H. White, sanitary engineer; J. Humphreys, fifth assistant engineer; J. C. Dishman, junior engineer; E. B. Powell, junior electrician; A. R. Wills, junior engineer; R. H. Ivers, junior electrician; F. E. Gammel, junior electrician.

Dan G. Cooke, well known in Pacific Coast shipping circles, is now dock superintendent for the Redwood Line at San Pedro. Cooke was formerly traffic manager at Los Angeles for the General Steamship Corporation.

Fred A. Hooper, general freight and operating manager for the American - Hawaiian Steamship Company at Los Angeles, announced several changes in the personnel of the company's southern California offices.

J. H. Farmer, former cashier at the Wilmington office, has been transferred to San Francisco as assistant cashier; while **John F. Walsh**, chief clerk in the Los Angeles offices, succeeds Farmer.

M. H. Hellyer, contracting freight agent, moves into the position formerly held by Walsh, and **Robert Norton**, in charge of eastbound freight, has been assigned as contracting freight agent. **Lowell Thornton** succeeds Norman in charge of eastbound freight.

Harold Brinkerhoff, first assistant engineer aboard the Panama Mail liner Ecuador, is rapidly becoming known as the champion shark fisherman of the fleet. This popular young assistant engineer has twenty-five sharks to his credit, most of which were man-eaters captured off the coast of Central America. On his last trip from New York, while the vessel was in the roadstead off La Libertad, Salvador, Brinkerhoff landed a nine-foot shark, weight five hundred pounds. He brought home the teeth of this shark as trophies.

Captain Gregory Cullen is on the bridge of the Dollar liner President Garfield, replacing **Captain T. P. (Fairweather) Quinn**, who is remaining shoreside for one round voyage.

Captain Quinn was in command of the President Garfield when she was carried ashore in a strong current on a reef in the Bahamas group January 15. The vessel suffered little damage. The mishap marked the first in his long sea career.

Headquarters for the newly inaugurated **Hammond Line Inc.** have been established in the Merchants' Exchange Building, San Francisco, with **John Mahony** as district manager. Mr. Mahony's assistants are **R. E. Sheridan** and **George E. Hall.**

A. P. Hammond, one-time Pacific Coast manager for the Luckenbach Steamship Company and the Atlantic, Gulf and Pacific Line, is president and organizer of the company, which plans a fleet of ships for the intercoastal trade. The company has joined the Intercoastal Conference.

The officers elected to guide the destinies of the American Society of Marine Engineers for the ensuing year are among the best known maritime engineers on the Pacific Coast.

James Bullock, superintendent engineer for the Dollar Steamship Company, was unanimously elected president; **Robert Hill**, marine superintendent of the McCormick Steamship Company, was elected vice-president; and **Edward R. Brady**, president of the Eureka Boiler Works, was selected as treasurer.

A vote of thanks was tendered the outgoing officers by the entire membership, followed by a testimonial dinner.

Members of the executive council are: **Benjamin S. Free**, superintending engineer for various steamship companies; **Henry F. Gelhaus**, marine superintendent, Swayne & Hoyt; **James A. Cronin**, superintending engineer, Standard Oil Company (Calif.); **Henry J. Wolters**, port engineer, Matson Navigation Company; **Charles L. Grundell**, marine superintendent, C. C. Moore & Co.; **George Armes**, president, General Engineering and Drydock Company; **Walter Cox**, port engineer, Associated Oil Company; **Edward T. Senter**, port engineer, W. R. Grace & Co.; **Millard R. Hickman**, superintending engineer, Matson Navigation Company; **Merrill C. Johnson**, port engineer, Panama Mail Steamship Company; **William R. Muir**, assistant superintending engineer, Standard Oil Company (Calif.)

George A. Armes, president of the General Engineering & Drydock Company of San Francisco, who was recently elected a member of the executive committee of the American Society of Marine Engineers.

Executive council, San Pedro Branch: **Ray C. Jones**, port engineer, General Petroleum Company; **Stephen Lindo**, superintending engineer, Los Angeles Steamship Company; **Albert O. Pegg**, superintending engineer, Union Oil Company.

Trustees: **James W. Pendergast**, port engineer, Sudden & Christensen; **James Richardson**, retired chief engineer; **Murdock Murray**, assistant port engineer, Dollar Steamship Company; **Hillmor Smith**, assistant superintending engineer, Standard Oil Company (Calif.).

Harry S. Eaton, chairman of the Portland Maritime Safety Committee, reports that as a result of the safety campaign that has been underway the number of accidents and loss of time has been greatly reduced. The safety campaign has resulted in a well-recognized reduction in accidents among maritime workers in all ports of the Pacific Coast.

H. A. Higgins, chief engineer of the Dollar liner President Garfield.

Captain John A. Rylander, shipping commissioner at Los Angeles harbor, announced the appointment of **Allen E. Woodruff** as his assistant. Woodruff is well known in Pacific Coast steamship circles.

Death claimed **Captain Robert Innes**, for thirty years marine superintendent at Hongkong for the Butterfield Swire Line of London, while he was in New York en route to San Francisco. He had just retired and had been on a visit to London. Captain Innes was known to hundreds of mariners and was one of the most popular maritime figures in Far East maritime circles.

The **Grace Line** has made arrangements to install refrigerator compartments in all their steamers operating between Pacific Coast Ports and West Coast of South America. The only vessel of the fleet that will not be refrigerated will be the steamer Cacique. The cold storage space on the vessels will be ready for the opening of the 1929-1930 refrigerator cargo season. Each vessel will be provided with space for 150 tons of refrigerator cargo, with the construction such as to permit ready enlargement.

The recent construction of cold storage facilities at Valparaiso and Callao has been a boon to refrigerated trade to those ports. The Grace Line is reported also to be considering extension of their service to Valparaiso and San Antonio on regular schedule. At present vessels of the Grace Line end their voyages at Antofagasta, only going further south when cargo offerings warrant calls at these two ports.

Steamship Day, staged by the San Francisco Transportation Club with a luncheon and entertainment the end of last month, was a highly successful affair.

G. Harold Porter, manager of the Pacific division of the Radio Corporation of America, was the guest of honor. The following well-known steamship executives were in

charge of the arrangements:

Charles L. Wheeler, vice-president and general manager of the McCormick Steamship Company; **William H. Sellander**, general passenger traffic manager of the Matson Navigation Company; **Chester Norton**, of Norton, Lilly & Company; **H. H. Pierson**, Robert Dollar Steamship Company; and **W. E. Dooling**, assistant district manager of the American-Hawaiian Steamship Company.

Edward A. Kelly, who joined the Merchant Fleet Corporation as vice-president, is now in full charge of what remains of the Merchant Fleet Corporation assets. He succeeded **Brigadier General A. C. Dalton**, who resigned last month. Kelly, who served for thirty years with the Clyde Line, will continue in the Government's service until all holdings of the Merchant Fleet Corporation have been disposed of throughout the United States.

Preliminary studies are now under way along San Francisco's waterfront to select a site for the erection of the huge cold storage plant to cost $2,000,000 that is assured of construction.

Frank G. White, chief engineer of the Harbor Commission, is one of the leaders in making the survey. He stated that Mission Rock was originally selected as the location favored by agricultural and shipping interests, but that as yet no decision has been arrived at by the harbor board.

A total of 210 vessels representing 494,447 gross tons were a total loss during 1928, according to the annual report issued by the **Liverpool Underwriters' Association.** These figures are higher than 1926, when 204 vessels of 418,419 gross tons were the toll of the sea. In 1924, the report stated, there were 174 vessels of 377,563 tons lost.

Department of Commerce reports a marked decline in ship construction in American shipyards for 1929, according to contracts let by American steamship operators. On Jan. 1 of this year American yards had contracts or were building only 60 steel vessels of 73,896 gross tons, compared with 181 steel vessels of 148,893 gross tons on December 1, 1928.

Promotion of **Ralph T. Sullivan** as district freight agent for the Luckenbach Steamship Co. in San Francisco was announced by company officials. Sullivan, who was formerly chief clerk, succeeded A. W. Smith, who has been appointed assistant general freight agent at Los Angeles.

Captain Gregory Cullen, master of the Dollar round-the-world liner President Garfield.

H. H. Pierson, formerly with the Dollar Line, becomes affiliated with the Williams, Dimond & Co. organization the first of this month. Pierson is widely known as a freight expert in Pacific Coast steamship circles.

George E. Chapin, assistant general freight agent at San Francisco for the Nippon Yusen Kaisha, has been elected chairman of the southern district of the Pacific West-bound Conference.

Harold Brinkhoffer, first assistant engineer, Panama Mail liner Ecuador, and champion shark catcher.

"This year's business in the intercoastal and gulf trades promises to be the best in the history of this traffic," is the prediction of **Joseph Scott**, general manager of the Transmarine Line, with headquarters in New York.

Scott stated that the gulf business is good, and with the re-establishment of the Gulf Conference on a basis similar to the Intercoastal Conference, the Transmarine Line was looking forward to a banner year.

S. S. Norton, an official of Norton, Lilly & Company, on his first visit to the Pacific Coast since 1918, expressed amazement at the development of all Pacific Coast ports, upon an inspection tour late last month.

Mr. Norton's grandfather founded the line in 1811. At that time it was known as the Norton Line. It operated between New York and South America, and is still operating on regular schedule. Norton, Lilly & Company are among the foremost steamship companies in the United States.

The **Los Angeles Transportation Club** is now located in their beautiful new club quarters in the mezzanine floor of the Hotel Alexander. These quarters, declared to be among the finest transportation clubrooms on the Pacific Coast, were opened late last month with an elaborate program of entertainment and a banquet. **T. A. Loretz** is president of the Los Angeles Transportation Club.

J. Kraack, former export manager for the Bradley-Wise Paint Company and prominent member of the Los Angeles Foreign Trade Club and Harbor and Foreign Commerce Committee of the Chamber of Commerce, is now head of the export department of the **General Paint Company** in San Francisco. The transfer of Kraack to San Francisco was brought about through the merging of the Bradley-Wise Paint Company and the Brininstool Paint Company with the General Paint Company and the centering of the three firms in the Bay City.

L. P. Gillchrest, vice-president of W. R. Grace & Company, and a brother-in-law of J. P. Grace, is making an extended tour of the Pacific

Coast, inspecting holdings of the company. He will be here for a month. This is Gillchrest's first visit to the Pacific Coast in several years.

Hugh Gallagher, assistant manager of the Matson Navigation Company, is the newly-elected president of the San Francisco Waterfront Employers' Union. **Thomas G. Plant** of the American-Hawaiian Steamship Company was elected vice-president; **W. P. Bannister**, operating manager for the Admiral Line. second vice-president; and **M. H. H. Lambert**, secretary-treasurer.

The following comprise the board of directors: **Hugh Gallagher, W. J. Edwards, Thomas G. Plant, W. P. Bannister, Charles King, M. J. Wright, C. C. Mallory, Fred L. Doelker,** and **J. G. Ludlow.**

H. C. Cantelow, widely-known steamship executive, formerly with the Admiral Line and later vice-president of the Luckenbach Lines, is now handling activities at Los Angeles harbor for **Kenneth B. Dawson,** who has recently purchased the four steamers from the California & Eastern Steamship Company.

Mr. Cantelow closed his San Francisco offices, and is now stationed in Los Angeles. Cantelow is handling the turning over of the four California and Eastern Steamship Company's steamers to the Quaker Line for the intercoastal service. Dawson is an executive of the Quaker Line.

John W. Chapman, formerly Pacific Coast manager for the Williams Line, and now vice-president of the Dimon Line, with headquarters in New York, following an inspection tour of the Pacific Coast, expressed confidence in the growth and stability of the intercoastal trade. Chapman voiced the opinion that the greatest West Coast need at present is for an American service to Europe.

Robert H. Donse, second engineer, steamer Maunalei, in front of his home in Honolulu.

Changes in the surveying staff of the Board of Marine Underwriters of San Francisco affected **Fenton Young,** surveyor for the board at Wilmington, who has been transferred to Seattle. **Captain Thomas White,** recently appointed to the board, succeeds Mr. Fenton.

Kenneth J. Burns is president of the Shipping Federation of British Columbia for the ensuing year. The election was held at Vancouver. **K. A. McLennan** was elected first vice-president and **D. M. Caperon** of Dodwell & Company was elected second vice-president.

CUTLER-HAMMER CHANGES NAME.

ANNOUNCEMENT has been made of a change in the name of the Cutler-Hammer Mfg. Co., Milwaukee, Wisconsin, manufacturers of electric motor control, wiring devices, and allied lines. The new name of the company will be Cutler-Hammer, Inc.

The new company is organized as a Delaware Corporation with the following officers: Chairman of the Board, F. R. Bacon; President, B. L. Worden; Vice - president, F. L. Pierce; Vice-president, J. C. Wilson; Treasurer, H. F. Vogt; and Secretary, W. C. Stevens.

The Board of Directors is composed of F. R. Bacon, F. L. Pierce, and L. A. Lecher of Milwaukee; B. L. Worden, West Orange, New Jersey; Carl A. Johnson, Madison, Wisconsin; and T. Johnson Ward, New York.

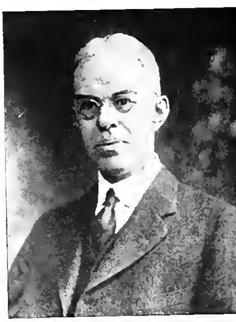
In the change from a Wisconsin to a Delaware corporation, the Cutler-Hammer Mfg. Co., Milwaukee, the Cream City Foundry Co., Milwaukee, and Cutler-Hammer Manufacturing Company, New York, are united under one name.

Obituary

SAMUEL WYLIE MILLER, consulting engineer of the Union Carbide and Carbon Research Laboratories, Inc., of Long Island City, well known both in the United States and in Europe as a pioneer in oxy-acetylene welding and an authority on its application, died on February 3 at his home in Hollis, Long Island, at the age of sixty-two.

Mr. Miller was a native of New York and received his degree in mechanical engineering from Stevens Institute in 1887. His first professional activities were as master mechanic for the Pennsylvania Railroad plants at Logansport, Indianapolis and Columbus. Following this he was with the American Locomotive Company at Dunkirk, New York, and Providence, after which he founded the Rochester Welding Works at Rochester. During the World War he served on the Welding Committee of the Emergency Fleet Corporation. In 1921 he joined the newly formed Union Carbide and Carbon Research Laboratories, Inc.

In professional circles Mr. Miller was recognized as an able engineer. He was a director, past president, and doner of the Miller Medal of the American Welding Society, a director of the American Bureau of Welding, and chairman of the Oxy-Acetylene Committee of the International Acetylene Association. As a member of the Welding Subcommittee of the Boiler Code Committee he was prominently identified with the American Society of Mechanical Engineers. He was an active member of the American Institute of Mining and Metallurgical Engineers, American Society for Steel Treating, British Iron and Steel Institute, Institute of Metals, and other scientific and engineering organizations.



Samuel Wylie Miller

Trade, Traffic, and Shipping

(Continued from Page 103)

seem unnecessary to take the time of this conference for further consideration of the subject.

This would probably be so were it not for the fact that the present condition of our merchant marine is so critical that it is necessary to explore every possible means of assistance to prevent what can easily be a national humiliation.

It is not the expectation of the speaker that he can tell his listeners anything they do not know concerning this subject, but it is his hope that he may remind them of some of the things they already know and perhaps quicken in them the determination to urge the adoption of some methods seemingly so easily available which can quickly give the same prestige to America afloat as America ashore now possesses.

It is not the object of this paper to show our present condition at sea, for doubtless others will bring that sad phase to your notice. You will doubtless be vividly shown that with the advanced type of construction being carried on by foreign maritime nations American vessels, practically all of obsolete type, will soon be driven from foreign trade. Whatever help comes to them can come from but one source, and that source is the American people. We have no right to expect aid from our competitors. Their advantage is to keep us weak on the sea, and the story of Gulliver and the Lilliputians is now being enacted before our very eyes. Seemingly we have not yet profited by the terrible lesson given us by the great war, and within a very few years we will be in the same situation 1914 found us, when our merchandise was rotting on sidings extending miles back from the coasts simply because we had no ships of our own. This unpreparedness cost us many billions of dollars and all that goes with it. These conditions existed because we had for years previous to that time refused to adopt methods which would have given us a merchant marine adequate to our national needs. Under the same circumstances the same deplorable state of affairs can occur again.

Norwegian Merchant Marine

THE outstanding maritime nation of the world today is Norway, with more than a gross ton of ocean shipping per inhabitant.

With 73 per cent of her 125,000 square miles mountainous, 23 per cent forest land, and only 3 per cent under cultivation, Norway has a population of 2,800,000 who maintain a merchant marine which, at the end of 1928, amounted to over 3,000,000 gross tons. Some interesting pariculars of his fleet and its operations are given in the following extract from a recent issue of Commerce Reports published by the U. S. Department of Commerce:

"Before the war the Norwegian merchant marine, of 2,586,000 gross tons, occupied fourth place among the shipping nations of the world. Of this tonnage, 658,000 tons consisted of sailing ships and only 10,000 tons of motor-driven vessels, the remainder being 1,918,000 tons of steamships. During the war Norway lost nearly 50 per cent of its entire fleet. In spite of the serious depression in shipping which followed the war, Norway succeeded in rebuilding its fleet, which amounted to 2,944,000 gross register tons at the end of 1927. The remarkable feature is such a complete reorganization that motor-driven ships have taken the place of the sailing vessels used in pre-war days. The fleet is now of 2,232,000 tons steamships, 686,000 tons motor-driven vessels, and only 26,000 tons sailing vessels. As steamships and motor vessels are much more efficient than sailing ships, the relative importance of Norway's present fleet is much greater than its pre-war merchant marine. Norway possesses at present the second largest fleet of motor-driven vessels—next to that of Great Britain. It also has the world's third largest fleet of tank vessels.

The development has followed specialized lines. Inasmuch as the day of the old tramp steamer is passing, Norwegian shipping interests have established regular shipping lines in various parts of the world. Norway needs but 30 per cent of the fleet for its own purposes; the other 70 per cent serve foreign countries; no subsidy is given by the Government, the country has no colonies, and is in keen competition with other European shipping countries having special privileges.

The gross revenue from shipping, of about $115,000,000 in 1927, partly makes up for the adverse balance of trade of the country.

Europe Steps Out

SIGNS not only of a quickening pace in European industry, but of the adoption of a new business philosophy, are heralded in a report to the American Section of the International Chamber of Commerce from the Acting American Commissioner at the organization's headquarters at Paris.

"There are signs," he says, "of a significant change in European business philosophy, the characteristic of which is a trend towards what may be described as American ideas and methods. Subsidies, cartels, and the government in business are prominent features of European life which still flourish, but they are more landmarks of necessities now passing than milestones of future developments. The desperate straits of industries which prevailed a few years ago have vanished; business no longer demands subsidies as before. The tremendous overproduction in many branches is rapidly passing with the rise in the purchasing power, and the primary urge towards national and international cartels is waning. The catastrophic conditions, which forced governments into business where profits were not to be hoped for, have almost disappeared. There are now many reasons for the confident prophecy that Europe will within the next twenty-five years attain a level of prosperity and a standard of life that will resemble and perhaps even surpass that of the United States today."

A Scene On the Waialae Course

FOR GOLF AMID LUXURY

Hawaii!

Visit the Hawaiian Islands in March, April and May! Play golf on the new Waialae course, owned by The Royal Hawaiian Hotel, a course which Harold Sampson, noted California professional, describes in "The Fairway" as:

> *"An ideal hotel links, from which pleasure can be derived without undue exertion. From the championship tees and with the hole played strategically, it becomes a real test of golf skill, as was proven by the scores in the Hawaiian Open Tournament."*

There is a charm about life in Hawaii. People from all the world find delight in the beauty and luxury of The Royal Hawaiian Hotel. This pink coral palace rises at the rim of Waikiki's velvet surf, where those who know the value of wise idling enjoy surf-riding, outrigger canoeing, the healthful cult of sun-bathing, and unsurpassed motoring over concrete highways.

In September—A Great Cruise around the Pacific

September 21 the great new Matson deluxe liner MALOLO will sail from San Francisco on a notable "Around the Pacific" cruise, visiting 11 countries, on a 90-day voyage covering 23,000 miles. The cruise is sponsored by the San Francisco Chamber of Commerce, and managed by the American Express Company. Join this great tour. Write C. C. Moore, the cruise chairman, c.o. S.F. Chamber of Commerce, for full information.

Australia!

Express passenger service, 19 days, via Hawaii, Samoa and Fiji.

215 MARKET STREET
SAN FRANCISCO

[DAvenport 2300]

Matson Line

HAWAII · SOUTH SEAS · AUSTRALIA

WORLD WIDE

IMM

FREIGHT SERVICE

Frequent Sailings ***Prompt Forwarding***
102 SHIPS. OVER 1,000,000 TONS
57 YEARS' EXPERIENCE

International Mercantile Marine Company

White Star Line — Red Star Line
Atlantic Transport Line — Panama Pacific Line
Leyland Line — White Star Canadian Service

460 Market Street, San Francisco

E. K. WOOD LUMBER CO.

Export and Domestic Fir Cargoes
Cut to Order
1 DRUMM STREET, SAN FRANCISCO, CAL.

MILLS AT
Anacortes, Washington — Hoquiam, Washington.

YARDS AT
Oakland, Cal. — Los Angeles, Cal. — San Pedro, Cal.

STEAMERS:
"El Capitan" "Cascade" "Olympic"
"Siskiyou" "Shasta"

MOTORSHIP: "Lassen" — SCHOONER: "Vigilant"

Cable Address: "Ekaywood."

RED STACK TUGS

Harbor and Coast Towing

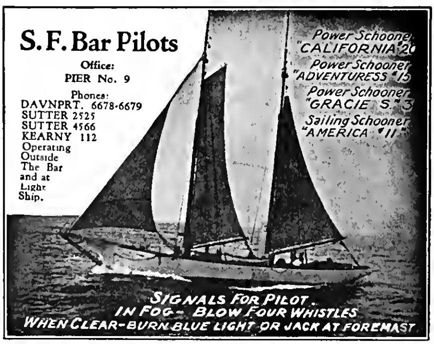
SALVAGE TUG "SEA SALVOR"

THE SHIPOWNERS & MERCHANTS TUGBOAT COMPANY

GREEN ST. WHARF (PIER 15)

Telephones: Davenport 3497-3498; Davenport 4268

OFFICE OPEN DAY AND NIGHT



Freight, Charters, Sales

February 14, 1929.

THE following steamers are reported fixed with grain to the United Kingdom / Continent: Swedish str. Asterland, Vancouver to Denmark, Feb., East Asiatic Co.; British str. Sheaf Mount, Vancouver to U.K.-Continent, 32/-, Mar., Canadian Cooperative Wheat Producers; British str. Leeds City, Vancouver to U.K.-Continent, 33/-, option Prince Rupert loading 9d extra, Feb.; Japanese str., Vancouver to Greece, 37/-, Feb.; British str. Kelvenia, Vancouver to U.K.-Cont., Jan./Feb.; British str. Sedgepool, Portland to U.K.-Continent, Feb., Continental Grain Co.; Japanese str. Chile Maru, Vancouver to U K -Continent, Feb., Canadian American Shipping Co ; a British str., Vancouver to U.K.-Continent, 31/-, option Antwerp or Rotterdam, 30/6, Mar.; British str. Bosworth, North Pacific to U.K.-Cont., June; British str Simonburn, Portland to U. K.-Continent, 31/3, option Vancouver 30/-, Feb., Kerr Gifford & Company; British str. Tre . . ., Vancouver to Greece, 37/-, 6d. extra each additional port up to four, Mar.; a Chapman str., Vancouver to U.K.-Continent, 31/-, Antwerp/Rotterdam, 30/6, Mar.; a steamer, Vancouver to Greece, 37/-, Feb.; British str. Hazelside, Portland to U.K.-Continent, 33/9, Mar., Heatley & Co.

The following grain fixtures to the Orient are reported: British str. Bosworth, Vancouver to the Orient, wheat and lumber, lump sum, Mar., Canadian American Shipping Co.; Japanese str. . . . . Maru, Vancouver to Shanghai, $5.15, Mar.; Japanese str., same, $5.15, Mar.

The British str. Dalblair is reported fixed with lumber from Columbia River to Australia, Feb., by J. J. Moore & Co.

The following lumber fixtures to the Orient are reported: Japanese str. Buyo Maru, Puget Sound to Japan, Mar., Allen Shipping Co.; Japanese str. Havre Maru, Grays Harbor to Japan, Feb., Yamacho & Co.; Japanese str. Rozan Maru, North Pacific to Japan, Mar., same charterers; British str. Sethonia, Coos Bay and Columbia River to Shanghai, $11, Mar., Dant & Russell.

The following tanker fixtures are reported: A steamer, California to North of Hatteras, 65c, February clean; a steamer, same, 63c (rate unconfirmed); American str. Birkinhead, California to North of Hatteras, 65c, Feb.; Norwegian m.s. Orkanger, San Pedro to Vancouver, at or about 14c, prompt.; Norwegian m.s. Markland, California to U K.-Continent, 26/-, second half. Mar., clean: American str. William H. Doheny, California to North of Hatteras, 65c, Feb., clean.

The Italian steamer Edda is reported fixed from Seattle and Portland to Rotterdam and Hamburg with refrigerated cargo, March loading, by Canadian American Shipping Company.

The following time charters are reported: British m s. Neptunian, 1 trip, delivery and redelivery Japan via North Pacific: Danish m s. Nordhval, Pacific trade, 18 months, delivery Colon, $1.52½, April/May, American Trading Co ; British m.s. Cape of Good Hope, delivery and redelivery Japan via North Pacific, $1.55, Feb./Mar., J. J. Moore and Co.; German str. Ditmar Koel, delivery Japan, redelivery Australia via North Pacific, $1 10, February; Norwegian m.s. Heina, delivery and redelivery Australia via North Pacific, $1.52½, Jan./Feb., American Trading Co.; Norwegian str. Dagrun, 20 months, Pacific trade, delivery Colon Apr., redelivery Australia, $1.57½, American Trading Co.; Danish m.s. Peter Brown, 3 years Pacific trade, delivery Denmark Mar., $1.50, J. J. Moore & Co.; British str. General Smuts, 12 months Pacific trade, delivery and redelivery Australia, $1.05, Mar., American Trading Co.; British str. Benvenue, delivery Vancouver, redelivery U.K.-Cont., $1.60, Feb./Mar.; Norwegian str. Marstenen, Pacific trade, 1 round voyage, delivery and redelivery U.S. North of Hatteras, $1.80.

The following sales are reported: American str. Hutchison, United States Shipping Board to McCormick Steamship Co., reported $45,000; American strs. Houston and Minooka, U.S. Shipping Board to Swayne & Hoyt; American strs. West Katan, West Keats, West Mingo and West Monton, California and Eastern Steamship Company to Kenneth D. Dawson, Portland; American str. North King, Alaska-Portland Packers Assn. to the Pacific American Fisheries, Bellingham, Washington; American str. Callabasas, Atlantic Fruit Company to Hammond Lumber Co.; American bkt. City of Sydney, Northern Fisheries Company to Japanese parties (to be scrapped); American str. Mohinkis, General Engineering & Drydock Co. to Alaska Packers Association.

PAGE BROTHERS, Brokers.

Some Notes on Export Packing

THE following suggestive notes from various foreign markets give some idea of the methods used in packing certain commodities. The notes were culled from "Commerce Reports."

Packing of Dried Fruits in Algeria

Dates for retail in Algeria are packed in artistic oval cartons of one or two pounds, in decorated wood boxes of two to six pounds, and in decorated tins of 11 to 22 pounds. They may be had also in plain wood boxes of from 2 to 11 pounds. Dates for export in bulk are packed in light-weight wooden boxes, bound with wire strapping, having a net weight of about 56 pounds. Inferior qualities are shipped in skins or sacks.

Figs for retail are sold in decorated cartons of 1 to 4 pounds, or in plain wood boxes of 6 to 11 pounds. The packing of these small quantities is loose enough for the fig to retain its shape. Best quality figs in bulk are shipped in light wood boxes containing 20 to 30 pounds. Inferior qualities are shipped in skins or, more generally, in sacks. (Consul General Lewis W. Haskell, Algiers, Algeria.)

Flour to Accra, Gold Coast Colony

As flour must be put ashore at Accra by means of surf boats, it should be packed in water-tight barrels of 196 pounds net. These barrels receive very rough handling both on board ship and on shore. The native boy carrying them up the beach usually wades out to the surf boat, has the barrel placed upon his shoulder, and when he arrives at the customhouse, drops it without bending over. There is usually a small mat to break the jar of the fall, but if the barrel drops on end it is almost sure to crack open. Usually the barrel is coopered with six metal hoops and has metal braces across the ends. (Assistant Trade Commissioner Charles K. Morris, Accra, Gold Coast Colony.)

Textiles to Hong Kong

Plushes and similar textiles are

generally wrapped in strong paper or in cardboard boxes and are packed in strong wooden cases. It is desirable that the cases be tin lined, in order to protect the goods against the humid climate and pilferage. (Consul General Roger Culver Tredwell, Hong Kong, China.)

Packing Botanicals and Essential Oils in Yugoslavia

Sage leaves, which constitute the bulk of the exports of botanicals yielding essential oils, are shipped in pressed bales wrapped in waxed cloth. The bales usually weigh 50 kilos (115 pounds). Roots and bays are packed in cases of approximately 30 to 50 kilos (70 to 115 pounds), while rosemary oil is shipped in wooden cases containing two tins. (Consul K. S. Patton, Belgrade.)

Newsprint Shipments to Chile

Rolls of newsprint imported into Iquique are first wrapped in heavy paper, then entirely enclosed with wood. They are likewise reinforced with iron straps.

Rolls in use in Iquique are 35, 52, and 70ins. wide. The 52-in. width is not generally employed. Diameters vary, but the rolls contain approximately 5,300 meters of newsprint for all widths. The gross weight of a 70-inch roll is 517 kilos (1140 pounds), the net being 495 kilos (562 pounds). The 35-inch roll weighs 271 kilos (598 pounds) gross and 255 kilos (562 pounds) net. (Consul Robert R. Bradford, Iquique.)

Parcel-Post for Bolivia

The La Paz Association of Commerce has called attention to the form in which parcel-post packages are being sent from the United States, and has recommended that, inasmuch as most of the shipments arrive badly packed and with the contents damaged, American exporters adopt the plan of shipping parcel-post packages to South America—particularly those destined to Bolivia—wrapped and sewed in burlap.

At the request of the La Paz Association of Commerce, an inspection was made recently of the receiving office of the La Paz parcel-post customhouse. Of the packages coming from the United States, in many cases exporters had used lightweight wrapping paper, such as is used in department stores, without even a cardboard container within the paper. In other instances, strong twine had cut its way through the paper and small contents of the shipment were lying about on the floor.

Shipments from France were also in deplorable condition, but every package from Germany was securely packed in a square or oblong package, each strongly sewed in burlap and the continuous cord with which the packages were sewed was sealed at the knot with either sealing wax or a small leaden seal.

Handlings of American Parcel Post. The necessity for strong packing will be apparent when it is considered that American parcel post, after being loaded onto the ship in New York or other American port, is subjected to the following handlings:

At Mollendo it is hoisted out of the ship's hold in a sling. It is then hoisted from the deck and lowered over the side of the ship into a lighter, which, rising and falling on the shorter seas that do not affect the ship, often gives the contents of the sling a severe blow when the lighter rises and meets the descending sling. At the port of Mollendo the seas are always so rough that passengers, as well as freight, are hoisted up to shore from lighters, and here, again, the mail sacks get another jar when the crane man releases the sling and the load is dropped on the stone pier. Each sack is then carted on the backs of peons from the dock to the Peruvian receiving post office, where sacks are again dumped in a pile, in a room for receiving transshipment freight in bond for Bolivia. From here peons cart the sacks on their backs to the train, throwing them into a car, where mail clerks stow the sacks for transshipment by rail to Puno. At Puno the mail clerks sling the sacks out onto the station platform in a pile. Another gang of peons take each a sack and cart it across to the dock, where it is dropped, sack on sack, into a net sling. When the net is full, it is hoisted by the ship's crane and lowered into the hold of the Lake Titicaca steamer, where the ship's crew stows it away. At Guaqui, Bolivia, or prior to arrival at the port, the ship's crew reassembles the cargo onto the ship's deck, and it is then hoisted in the ship's sling and dropped onto the dock at Guaqui. It is then carted across the dock and thrown into railway cars.

Upon reaching La Paz, the cargo is unloaded onto peons' backs and carried to the receiving room. It is then carted over none too good roads to the La Paz post office, and is then handled several more times before the consignee walks out with what is left of a package which would hardly have stood a parcel-post journey from Boston to New York.

Packages destined for Potosi and other remote places are reshipped from the La Paz general receiving post office, with a correspondingly large number of handlings by peons at every point. Sacks are transported to the railroad station in La Paz, taken by train to Oruro, transferred to another train, and taken to Cochabamba, where they are transported by motor trucks to Potosi. From there they are carried by mule back, the muleteer cinching them onto his mule as tightly as possible with ropes.

Pilfering. The La Paz customs officials state that too long cord is often used around the neck of the mail sack, so that pilferers may wear out the cord to make it appear that it has rubbed or frazzled out, and then after extracting articles have tied up the ends, leaving the seal intact. It was also stated that the Bolivian importers believe some of the pilfering is done long before the sacks are slung over the side of the ship at Mollendo, as pilfered packages are often filled with New York newspapers.

Three McCormick Ships a Day

PRACTICALLY three ships a day for every day in the year, and more than three ships on each working day, passing in and out of the Golden Gate!

That is the record set by the McCormick Steamship Company for 1928 at the port of San Francisco, according to Charles L. Wheeler, vice-president and general manager of the company, a total of 1001 arrivals and departures.

These American flag vessels operate in four separate routes—the Pacific-Argentine-Brazil Line between the Pacific Coast of North America and east coast of South America; the Munson-McCormick Line, intercoastal; the Pacific-Porto Rico-Jacksonville Line; and the McCormick Pacific coastwise service.

It is significant to note that 73 percent of these vessels visited the McCormick docks at Oakland.

Port Construction Notes

Victoria, British Columbia. The Victoria Cold Storage and Terminal Warehouse Company, Ltd., has let a contract to the Canadian Ice Machine Company of Vancouver, Canadian representative of the York Manufacturing Company, for the refrigerating equipment for the new Ogden Point cold storage plant, according to K G. Brown, managing director. The general contract for the construction of this plant has been awarded to Parfitt Brothers, Limited, and the cost of the entire plant will be about $550,000. The cold storage warehouse will be up to date in every respect. The system will provide for ice making, fish freezing, and general cold storage for all kinds of foodstuffs. All subcontracts will be let to Victoria firms.

Seattle. The Grand Trunk Dock is now operated as a ferry terminal by the Ferry Dock Company, composed of various ferry lines operating on Puget Sound. Captain F. E. Lovejoy, president of the Puget Sound Freight Lines, is manager of the freight department of the ferry dock corporation.

Engineers of the Port of Seattle are drawing up plans for a 1,000,000 bushel grain elevator to be located at Smith Cove. The City Engineering Department is working on plans for the construction of a seawall along the central waterfront of Seattle.

At the Bell Street Terminal 200,000 cubic feet of additional cold storage space will be provided The second floor of the transit shed will be extended, adding space 350 by 35 feet for storage of freight.

San Francisco. The proposal by the farming interests of central California for the state to build a cold storage terminal at San Francisco for the storage and precooling of California fruits and vegetables is being investigated by Governor Young and a committee of citizens. It has been proposed by the Board of State Harbor Commissioners that the terminal be built on Mission Rock as part of the harbor expansion program as projected in 1925. The committee has been instructed to investigate the publicly owned cold storage plants at Seattle and Portland.

Oakland. The rapid development of the Port of Oakland is keeping pace with the expansion of her port facilities now going forward under a $10,000,000 building program Contract was awarded in February for the construction of a warehouse and shipping terminal for Rosenberg Brothers of San Francisco, one of the largest shippers of California dried fruits. The warehouse will cost approximately $400,000, and is to be of steel frame and concrete construction. The warehouse is adjacent to the Fourteenth Street municipal wharf, and, under the lease with the Oakland City Council, all dried fruit packed in the company's 17 plants in California will be shipped through this terminal, a minimum annual tonnage of 50,000 being guaranteed.

One of the important units of Oakland's new harbor development will be the Brooklyn basin pier, which will be constructed on a dike and retaining quay which is now under construction. The area inside the retaining wall will be filled with material dredged from the Brooklyn turning basin. Bids have been called for dredging 250,000 cubic yards at this site. The American Dredging Company, San Francisco, submitted low bid of 24 center per cubic yard. The San Francisco Bridge Company bid 29 cents a cubic yard.

California Cooperative Producers have leased from the Oakland City Council a tract of 26 acres at the foot of Ninth Avenue on Oakland's inner harbor for the construction of a large terminal, and construction will start immediately on a cannery, warehouses, transit sheds, docks, and other buildings to be ready for this year's harvest.

On January 14 Oakland's status as an independent foreign trading port was recognized when the city was given the distinction of a port of entry. The Oakland port district includes Oakland, Alameda, Berkeley, Emeryville, and San Leandro, and ships will be able to clear from Oakland with cargoes from these cities without stopping at San Francisco.

Los Angeles Harbor. Plans for the construction of modern freight and passenger terminals on the northern end of the port's west basin are being formulated by the Harbor Department. Under the new terminal plan nine vessels can be accommodated at this point.

Stockton. Rapid progress is being made by the City of Stockton in the acquisitions of rights of way and parcels of land in the neighborhood of Pittsburg at the point on the San Joaquin River, where dredging work for the Stockton deep-water channel project will start. Work will start as soon as sufficient rights are obtained, without waiting for the acquisition of lands all along the proposed channel.

Grays Harbor, Wash. Port Manager W. H. Peters has announced that warehouse at terminal No. 1 will be enlarged by the addition of a 150-foot shed. The water system on the port property will be extended to afford proper fire protection.

Portland. The Oceanic Terminals, Inc., is now operating its new Elrod-Trimble Terminal at the site of the old North Pacific Lumber Company. The terminal has a dock 550 feet long on two slip sides and 538 feet wide on the river side. Large warehouses, cold storage warehouse, ample railroad and truck facilities are provided. A large share of the apple shipments out of Portland find their way through this terminal, and the owners plan the construction of two additional piers and cold storage space for 200,000 boxes of apples before the 1929 shipping season.

Mexico City. The government announced recently that 40,000,000 pesos ($20,000,000) would be spent in the next four years at ports of the Gulf and Pacific Coasts to improve facilities at Tampico, Tuxpan, Vera Cruz, Progresso, Salina Cruz, and Mazatlan.

Long Beach, California. Bids were called February 8 by the Board of Harbor Commissioners for the construction of approximately 4892 linear feet of bulkhead and dredging and disposal of approximately 1,100,000 cubic yards of fill as part of the port development program for this harbor.

Texas. A port district has been formed to help the development of a deep-water port at Point Isabel, the new corporation being known as the San Benito-Point Isabel Navigation District, San Benito.

Pacific Marine Review

The National Magazine of Shipping

APRIL, 1929

Official Organ

Official Organ

An Interesting Chart,
showing the Tracks of the famous
American sailing ship Great Admiral
on her round-the-world freight and
passenger services from 1869 to 1897.

Pacific Marine Review

The National Magazine of Shipping

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

Entered as second class matter June 20, 1913, at the post-office, San Francisco, under the Act of March 3, 1879. Entire contents copyright, 1928, by J. S. Hines. Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 15th. Subscription price, a year: domestic, $2; foreign, $3; single copies, 25c.

Official Organ
Pacific American Steamship Association

James S. Hines,
President and Publisher.

Bernard N. De Rochie,
Vice-Pres. and Manager.

Official Organ
Shipowners' Association of the Pacific

Alexander J. Dickie,
Editor

Paul Faulkner,
Advertising Manager.

Employment Service Vindicated

THE Marine Service Bureau, operated at Pacific Coast ports under the Shipowners' Association of the Pacific Coast and the Pacific American Steamship Association, has for seven years past been charged in the federal courts with "illegal restraint of foreign and domestic commerce." This suit was brought by Cornelius Anderson, a member of the Seamen's Union on behalf of himself and 10,000 other members of that Union.

The case was lost to the plaintiffs several years back, but they appealed to the Supreme Court on a technicality and obtained a new trial.

Judge Kerrigan of the Federal District Court dismissed the injunction suit last year, and the plaintiffs appealed to the Circuit Court. Last month the Circuit Court upheld the dismissal.

During all this long drawn out legal battle, the Marine Service Bureau has gone on steadily expanding its service and usefulness to the seamen and waterfront workers of the Pacific Coast in a manner that has won the admiration and praise of all who have had occasion to observe its work. The seamen themselves have come to look upon the Bureau as their own institution and to trust the good judgment and fair dealing of its management.

Were a vote taken today, very few Pacific Coast seamen would be found lined up with those 10,000 others for whom Cornelius Anderson claimed to have spoken. Its work with and for the seamen had amply vindicated the Marine Service Bureau long before the advent of this legal decision.

Marine Standards

THE year 1928 saw the low water mark for American shipbuilding, lower even than the hopeless ebb of 1927. Nineteen twenty-nine is looking up, and before this year closes we will probably be on the way to a real revival of the shipbuilding industry.

In order to be in line to take full advantage of the shipbuilding programs now projected by American operators, all American shipbuilders should analyze all economies available in management and in operation. In this connection, careful study should be made of the standards prepared and in process of development by the American Marine Standards Committee. The Shipping Board will no doubt require the use of these standards in all vessels getting government loans under the White-Jones Bill. These standards can be obtained at a nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D.C. Alphabetical and classified indices of these standards have been compiled and are available together with price lists. A few nickels or dimes invested in this way may save a shipbuilder thousands of dollars.

A Nice Contract

"THE contract for the construction of three turbo-electric Coast Guard cutters will be awarded to the General Engineering Company of San Francisco." So reads a news item released by the Treasury Department at Washington.

This nice construction job of approximately three million dollars will be handled at the Oakland yard of the General Engineering & Drydock Company by a very efficient organization of capable shipbuilders, and we predict that the Coast Guard will be proud of these three cutters.

Our congratulations to George Armes and to his organization.

The machinery installation will be furnished by the Westinghouse Electric & Manufacturing Company.

Foreign Trade for 1929

IN Baltimore on April 17 to 19 the National Foreign Trade Council will hold its sixteenth National Convention. Announcing this convention, the Council declares 1929 to be the most active Foreign Trade year since the war. The year 1928 showed a record volume of world trade for the United States. Exports exhibited a billion dollar advance over 1927. Both exports and imports so far in 1929 are running away ahead of 1928 and the Council reports the largest advance registration for the convention of any year in its history.

An excellent program has been prepared featuring many addresses from the most prominent experts on foreign trading subjects.

The world will be drawn directly into the "Get Together Banquet" on the opening night through a special radio and wire hook-up.

All foreign traders who can do so are strongly urged to attend these meetings.

Shipbuilding Research

THE United States Shipping Board, as part of its plan for research into all phases of American ship operation, is now entering into a nation-wide discussion with shipbuilders and ship operators of the best ways and means for overcoming cost differential in shipbuilding at American shipyards as compared with foreign shipyards. This discussion is one of the results of the recent marine conference at Washington, where this subject was uppermost in the minds of the conferees.

The shipbuilding research committee named by Chairman O'Connor of the Shipping Board included Rear Admiral Hutch I. Cone, Shipping Board Commissioner; Alfred H. Haag, director of the Shipping Board Bureau of Research; Captain C. A. McAllister, president of the American Bureau of Shipping; A. L. Critchter, chief of the Transportation Division, Department of Commerce; and representatives of all national shipbuilding concerns and marine engine manufacturers.

Among the suggestions to be considered are:

(1) A 50 per cent duty on new tonnage. (This, of course, would be helpful chiefly in yacht construction.)

(2) Omitting interest on government loans on new construction up to the differential between American and foreign costs. (This would certainly encourage the building of new tonnage in American yards and would provide special encouragement to freighters not now helped by the mail provisions under the Merchant Marine Act, 1928.)

(3) Engines and auxiliary machinery to be built in concerns other than shipyards and standardization of this machinery. (Standardization is good and is now rapidly being accomplished by the American Marine Standards Committee. Building of machinery in outside concerns is done generally now whenever it offers opportunity to cut down costs.)

(4) Adaptation of structural steel codes to shipbuilding, cutting down of overhead by reducing plant investment, and cooperation between shipbuilders, shipowners, and naval architects. (All very good suggestions if effected wisely and without too much high-powered efficiency engineering.)

The Oil Tanker

THE following article from the Associated Oil Company "Record" for March states very simply the usefulness of the oil tanker and the difficulties in operating under American register.

The very earliest marine transportation of petroleum was accomplished by the simple expedient of putting tanks on the deck of a ship; but it was not long before the idea developed of carrying the oil inside the hull of the vessel. The putting of this plan into effect in England in 1885 marked the birth of the oil tanker. From this simple beginning the tanker has developed until at the present time it is the safest type of ship afloat and, in the freight-carrying classification, among the largest.

Due to its structural design and the large number of water-tight compartments, the modern oil tanker, as already mentioned, is undoubtedly the safest ship afloat from the standpoint of seaworthiness. The average 10,000-ton tanker has about forty water-tight compartments, including cargo tanks, bunker tanks, fresh water tanks, and cofferdams. Because of these facts the principal maritime nations, now working on an international load line agreement for all types of vessels will probably give the oil tanker at least fifteen per cent reduction in freeboard.

Most of the recently constructed tankers have been built abroad, and during the year 1928 there were constructed or in the process of construction in foreign yards tankers whose aggregate carrying capacity is about ten million barrels. The reason for constructing these vessels abroad is, as might be expected, lower cost. In general, it may be said that the cost of building a tanker abroad is only about half that of building it in an American yard.

This is due largely to lower labor costs and other factors closely related to the standard of living—thus in one sense at least reflecting favorably on American conditions. These tankers run into large sums of money, and a 10,000-ton vessel, which is about the average tanker, if steam driven, costs in the neighborhood of $600,000 built abroad and $1,200,000 if built in an American yard; if diesel powered, about $800,000 abroad and $1,700,000 here.

For much the same reasons that govern the construction of tankers, their operation under the American flag is expensive; and thus it is explained why so many American-owned tank steamers are operated under foreign registry. Because of the higher wages required by American standards and other related conditions, the operating cost of a 10,000-ton steam tanker under foreign flag is approximately ten thousand dollars a month lower than operation of a similar tanker under the American flag.

The oil tanker is an interesting ship in the sense that it is almost always a one-way ship, carrying its cargo of oil in only one direction, and usually coming back in ballast. Because, however, of the enormous capacity of these vessels, the cost per barrel for marine transportation is very much lower than that for any other method.

The earlier tankers were driven by steam engines; but practically all the new oil carriers built abroad are powered with diesel engines, which have many advantages. Among the most important is the low fuel consumption, which is only about forty per cent of that used by a steamer. Consequently, with this low fuel consumption, it reduces the space required for bunkers and increases the vessel's cargo carrying capacity correspondingly. Against this, however, must be considered the fact that cost of repairs is somewhat higher than for steam installations.

There are other items of expense that are larger for the diesel ship due to higher cost of construction, such as insurance and depreciation; so that as a practical thing, the diesel-powered tankers are most economical for long voyages. Owing to the high cost of construction, as already mentioned, we cannot look for any large amount of building of diesel ships in this country until the price of bunker oil reaches a figure that will make the use of steam for propelling power prohibitive.

It is not possible to calculate accurately the amount of oil moved annually by the tankers of the world; but the total dead weight tanker tonnage at the end of 1928 aggregated approximately 10,350,000 tons—about twelve hundred ships with total carrying capacity of approximately seventy-two million barrels, representing an investment of probably well over a billion dollars.

The oil tanker, like the pipe line on land, is an unobtrusive but hard working unit of our great industry, and without the dependable transportation maintained by the marine department, efficient refinery and sales operation would be impossible.

Two New Super-Ships

United States Lines to Build Liners---Will be Larger and Faster than Leviathan---An Advisory Board Will Lay Down Basis for Design

By Harold M. Wick

THE preliminary steps leading towards the addition to the American merchant marine of two giant express passenger liners for North Atlantic service have been taken. The United States Lines, recently purchased by the P. W. Chapman interests and Joseph E. Sheedy, an experienced shipping executive, have now commissioned Theodore E. Ferris, New York naval architect and marine engineer and one of the country's leading ship designers, to prepare designs for vessels exceeding in size, speed, and hotel appointments, the Leviathan.

This new tonnage will have to compete with the new North Atlantic craft under construction in Great Britain, France, and Germany, and, therefore, no stone can be left unturned to the end of making these new American vessels the equal, if not better, than those with which they have to compete. With this in mind, an advisory board has been formed by Mr. Ferris consisting of the leading marine engineers and ship designers of the country. These men will be drawn from the shipyards interested in the building of these ships; namely, the Bethlehem Shipbuilding Corporation, Newport News Shipbuilding and Dry Dock Company, and the New York Shipbuilding Company.

On the engineering board will be Charles F. Bailey, directing engineer of the Newport News company; John E. Burkhardt, chief engineer of the Bethlehem Shipbuilding Corporation; and Mayson W. Torbet, assistant general manager of the New York Shipbuilding Company. The naval architecture division will include Ernest H. Rigg, naval architect of the New York Shipbuilding Company, Harold F. Norton, naval architect of the Newport News company, and Howard C. Towle, assistant to the vice-president of the Bethlehem Shipbuilding Corporation.

These two divisions will work under the leadership of Theodore E. Ferris. After all the elements have been worked out and a definite basis arrived at for the design, the plans and specifications will be completed by Mr. Ferris. At their completion the plans and specifications will be submitted to the three shipyards for a definite bid. It is quite probable that the two ships will not be built in one yard, but will be split up in two of the three yards bidding on them. Preliminary estimates have set the construction cost between $25,000,000 and $30,000,000, and 1932 has been indicated as the completion time for the two ships.

Joseph E. Sheedy, now the executive vice-president of the United States Lines and responsible for the entry of the Chapman interests into the shipping affairs of this country, lost no time in ordering designs prepared for the new ships; in fact, Mr. Ferris was commissioned to proceed with the work within a week after the United States Lines had been sold into private ownership. The preliminary work is already proceeding in Mr. Ferris' office, and the first meeting of the advisory board has been held.

The contract for the sale of the United States Lines from government ownership into private hands carried with it an obligation on the part of the purchaser to construct two ships to run with the Leviathan. In addition to these two vessels, the United States Lines is planning to also construct three smaller liners with a tonnage of about 35,000 each. These will probably follow after the big ships have been started. The new tonnage contemplated will be built with the aid of the Shipping Board Construction Loan Fund, and it is expected that the design plans of the first two ships will be in the hands of the Shipping Board and the Navy Department for approval before the fall of this year. With this program in view, bids will be solicited from the three shipyards before the end of this year and possibly contracts placed for their construction by the end of the year.

New Ships To Be Faster and Larger Than Leviathan

While running with the Leviathan, the new tonnage will be somewhat larger and faster in order to properly compete with the vessels that will be brought out on the other side of the Atlantic in the next few years. The Leviathan is 950 feet 7 inches long over-all, 907 feet 6 inches long between perpendiculars, 100 feet in beam, with a molded depth to D deck of 73 feet 1-3/8 inches. Her operating draught is 39 feet 6 inches, and she has a gross tonnage of 59,956 and a net tonnage of 27,696. The propelling machinery develops about 100,000 horsepower maximum and about 65,000 horsepower in normal operation. A crew of approximately 1000 is required and 3500 passengers are carried.

An interesting comparison of modern engineering practice is contained in the fact that while the Leviathan has 46 boilers, the new ships being built and to be built of this size and power here and abroad will in all probability have only 18 to 20 boilers; and with the present day trend toward higher boiler pressures probably 350 pounds steam pressure will be adopted together with superheat of a moderate amount.

On account of possible passage through the Panama Canal, the beam of all these big new ships is being limited to a maximum of about 102 feet.

A particular study of different types of propelling machinery suitable for big ship drives is being made for the new United States Lines' ships. This will include consideration of geared turbines in combination with high steam pressure, high temperature water-tube boilers; turbine electric drive in combination with high steam pressure, high temperature watertube boilers; diesel-electric drive; and straight diesel drive. Electricity will play a tremendous part in the operation of these ships, with practically all of the auxiliaries electric motor driven, and the ventilation, sanitary, refrigeration, and heating systems electrically operated. While the thought of two propellers has been advanced in connection with big ship design in the past, it is highly improbable that the super-ship of great tonnage can be efficiently driven by less than four screws.

In the operation of vessels of the big ship class it has been estimated that 86 per cent of the total gross revenue is derived from passenger movement, 10 per cent from the carriage of mails, and only 4 per cent from freight traffic and miscellaneous. Vessels in

this class and of the present day speed make an average of from 12 to 15 round trips per year. With these facts as to source of revenue already definitely established, special attention is to be paid to working out an efficient arrangement of passenger accommodations, public spaces, crew working spaces, and crew quarters in the new ships.

White Star and Cunard to Build New Super-Ships

Shortly before these new vessels for the United States Lines can be completed, the White Star Line will bring out a new express liner which will have a gross tonnage of about 60,000. This ship will be approximately 1000 feet long between perpendiculars and around 1050 feet long over-all, thus exceeding by 94 feet the length of the Majestic, which is at present the longest ship afloat though exceeded in tonnage by the Leviathan by about 3400 tons. Harlan and Wolf at Belfast now have this vessel under construction. Diesel-electric drive has been selected for the propelling machinery, and over 100,000 horsepower will be developed.

The Cunard Line, with its long standing tradition of speed supremacy, is understood to be at the point of ordering a new ship of the largest class, but to date has not announced any of the details of what is being planned.

In addition to this new English competition, the United States Lines will also have to face the fact that the Compagnie General Transatlantique has now ordered a new 55,000 ton liner, and latest advices are to the effect that the keel for the vessel has already been laid at St. Nazaire. This new addition will surpass the present flagship of the French Line, the Ile de France, in size, speed, and appointments. Its length will be nearly 1000 feet and a speed of 25 to 27 knots has been planned.

Two Italian transatlantic lines have announced that they are planning to add new tonnage of the super-liner type in the very near future.

Further additions to the transatlantic high speed liner fleet will be made as early as the summer of this year when the North German Lloyd will place in the North Atlantic trade the Bremen and Europa. These vessels are already classed as five-day ships for the crossing and are of 45,000 tons gross. They will be propelled by geared turbine machinery driving four screws. Such innovations in public spaces as bowling alleys and shooting galleries have been incorporated in them.

In addition to this new tonnage, there will still exist in the North Atlantic trade such super-ships as the famous Mauretania, Aquitania, Berengaria of the Cunard Line; the Majestic, Olympic, Homeric of the White Star Line; the Ile de France, Paris, De Grasse of the French Line; and Berlin, Columbus, Muenchen of the North German Lloyd; the Albert Balin and Westphalia of the Hamburg-American Line; and, of course, the Leviathan of the United States Lines.

Much Speculation As to Mount Vernon and Monticello

The sale of the United States Lines released the Shipping Board vessels Mount Vernon and Monticello for possible sale, action on the disposal of these ships having been held up pending consummation of the sale of the United States Lines and American Merchant Lines. Several American steamship lines have expressed interest in these two ex-German liners. The Munson Line has been mentioned as a possible purchaser for their South American service, while the Dollar Line and the Matson Line have also been reported as considering the vessels. Although Congress authorized the Shipping Board to spend $12,000,000 on reconditioning these two vessels, the Coolidge Administration strenuously fought the proposition on the ground that the estimated cost of putting the ships in service involved too large an expenditure, considering the age of the tonnage. The vessels are now laid up at Solomon's Island at a cost to the government of approximately $50,000 a year, which expense has been incurred for nearly ten years.

Government Piers In Hoboken May Be Purchased

The United States Lines now uses Pier 4, Hoboken, New Jersey, as a base for all of its vessels with the exception of the Leviathan which docks at Pier 86, North River, New York City, aside from an occasional lay-over at the Hoboken pier. The Chapman interests are now considering making an offer to the Shipping Board for the Hoboken piers which have been held by the government since their seizure in 1918. In this connection it is of much interest to note that the Chapman group controls the Hoboken Shore Railroad which serves these piers. Possession of the government-owned piers, together with the Hoboken Shore Line, would give the United States Lines a ship-to-rail connection not equalled at any other American port; in fact, with the development plans now worked out the company would be in an exceptionally strong strategic position for the establishment of a formidable American flag service. All of these government piers, totaling four in number, are served by the Hoboken Shore Railroad, which, in turn, is linked with the belt line connecting with all of the trunk lines having terminals on the New Jersey waterfront. The piers are among the finest in the harbor, have all modern facilities, and are equipped with up-to-date cargo handling equipment. They have sufficient depth of water to accommodate vessels of the size of the Leviathan. It is expected that the American Merchant Lines terminal will now be shifted from Pier 7, North River, New York, to the Hoboken piers.

Twenty-Five Years Ago

PACIFIC Marine Review for April, 1904, carried the following interesting items:

"Slowly but surely the water-tube boiler seems creeping into favor and threatening to supplant the boilers of the fire tube variety, though it must be conceded that the old Scotch marine boiler of the cylindical type has still its faithful advocates among marine engineers and constructors of great reputation and great experience. . . . Perhaps one of the features connected with the water tube boiler that most appeals to merchant owners is the speed with which these boilers can be blown down, repaired, or tubes renewed; can be refilled, steam raised, without danger of unequal expansion, and the vessel made ready for sea within the time necessary for loading cargo.

"Time is the essence of profitable shipowning and this fact alone bids fair to advance the crusade of the water tube boiler perhaps more than any other reason."

"The steamer Nebraskan (American Hawaiian) which sailed from San Diego February 3 and arrived in New York March 26 is the first oil burning steamer to round the Horn. This is a remarkable passage and augurs well for the future of oil as a marine fuel."

The Great Admiral and Three Commanders

Some Notes on the Careers of Three Noted American Sailors

By F. C. Matthews

IN January 1929, Pacific Marine Review published a short history of the American ship Great Admiral, illustrated by a fine reproduction of a painting by Charles Robert Patterson. This article attracted considerable attention and drew out some correspondence from men on the Atlantic Coast, among them W. G Sturtevant, who had been a main-skysail-yardsman aboard this vessel on an early voyage. To Sturtevant we are indebted for the photographs from which the illustrations reproduced herewith were prepared.

While these biographical sketches are necessarily fragmentary, they give a very good idea of the experience and training that produced the great sailing masters of the American merchant marine. For more detailed account of Great Admiral voyages under these skippers the reader is referred to Pacific Marine Review for January, 1929.

Captain Isaac N. Jackson

Captain Isaac N. Jackson, who was appointed to first command the Great Admiral, was born in Winthrop, Maine, in 1813 and died in Milford, Massachusetts, in 1898. Among masters in the old-time American mercantile marine he stood in the front rank, possessed great courage and resource, and was a strict disciplinarian of quick action, although possessed of a kindly disposition. A dignified and polished gentleman, he was known as "The Dandy Captain" from the great care he took of his personal appearance. He always took enough shirts with him so that he could have a fresh one for each day of the voyage.

Captain Jackson's first command was in 1847, when he took the new bark Marmion, built by Chapman & Flint at Thomaston, Maine. In 1855 he was master of the celebrated ship Spitfire, and two years later was placed in command of the new ship Belvedere owned by W. F. Weld & Co., Boston. He continued ten years in this ship, making annual voyages from eastern Atlantic ports to San Francisco, returning home by way of the East Indies. The Belvedere was at this period the crack ship of the Weld fleet and paid for herself many times over.

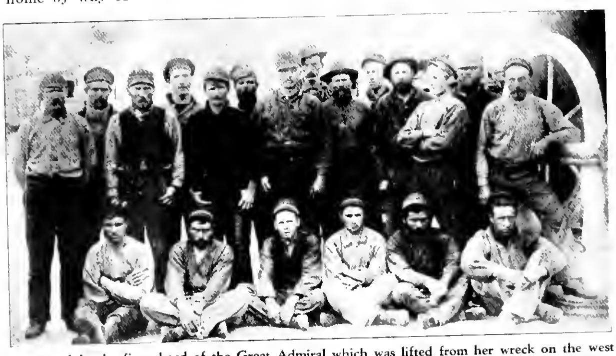
There is a story to the effect that the Belvedere was chased by the Confederate privateer Alabama in the Java Sea while homeward bound from Manila in December, 1863. She eluded capture but Captain Semmes was determined that she should not escape him, so lay in wait at the outlet of the Straits of Sunda. Captain Jackson, however, taking advantage of a dark night, slipped out to sea and got safely away. The published records of the Alabama's career do not mention this or any other instance in which Captain Semmes was unsuccessful in overtaking a vessel he was pursuing.

Captain Jackson was very successful in the three round-the-world voyages he made in the Great Admiral. On the maiden voyage of this ship, homeward bound from San Francisco, he made the excellent run of 37 days from the Golden Gate to Hong Kong, averaging 192 miles daily. Continuing thence to Manila he made the passage from there to New York in the very short time of 89 days; daily average, 145½ miles.

In 1874 Captain Jackson purchased an interest in the fine ship Spartan then being built at East Boston for J. Henry Sears of Boston and Commodore Theodore H. Allen, of San Francisco. In this ship he completed three round voyages between New York, San Francisco, and Liverpool, all in fast time. In March 1878 the ship drove ashore on Long Island and was sold, when Captain Jackson gave up the sea. The Spartan, floated and repaired, came out to the Pacific Coast and was operated in the coal trade for many years. In 1905 she was cast ashore and lost on one of the Hawaiian Islands.

Captain Benjamin Thompson

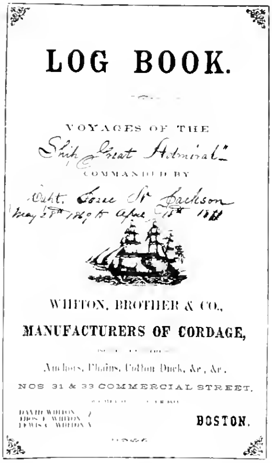
Captain Benjamin Thompson took command of the Great Admiral late in 1873 and, with the exception of a homeward voyage from San Francisco via Manila and



At left, the figurehead of the Great Admiral which was lifted from her wreck on the west coast of Queen Charlotte's Island and which is now a feature of interest on the Weld Estate, Boston.

Above, view of the assembled crew taken by a passenger on the voyage from New York to Melbourne, 1887. On her first voyage, the crew of the Great Admiral numbered thirty-six, all told; on her last voyage, twenty-three.

Log and Spars


LOG BOOK.

VOYAGES OF THE

Ship "Great Admiral"

COMMANDED BY

Capt. Jackson

May 28th 1869 to April 18th 18

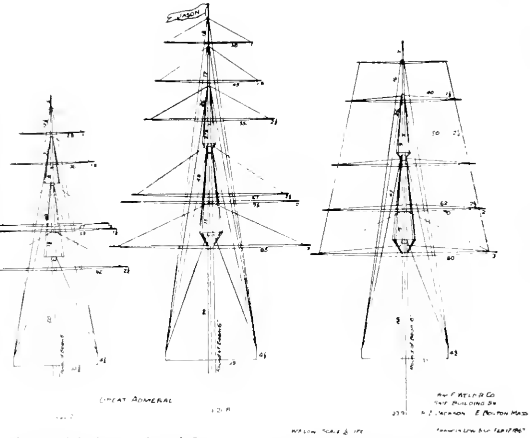
WHITON, BROTHER & CO.,

MANUFACTURERS OF CORDAGE,

Anchors, Chains, Cotton Duck, &c., &c.

NOS 31 & 33 COMMERCIAL STREET.

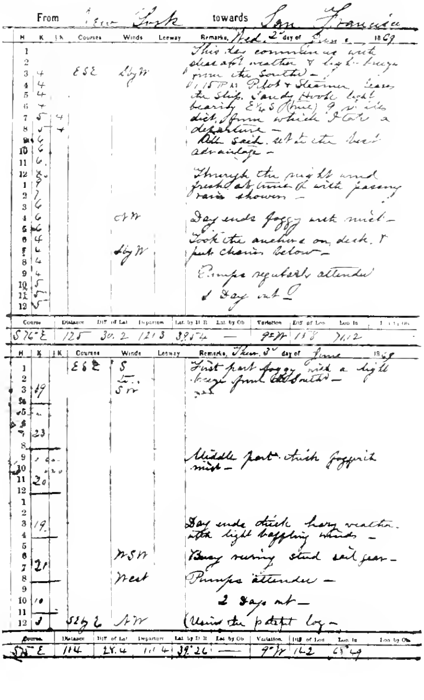
BOSTON.



Above, original mast plan of Great Admiral taken from the original drawn on brown paper by Francis Low.

Original intention was to name this ship Jason to go with the Golden Fleece already in the Weld fleet. Her name was changed to Great Admiral in honor of Admiral Farragut. Note spelling of "Admeral."

Below are facsimile copies of two pages from the log book on the first voyage; one showing the first two days; the other 47th and 48th days out. This voyage took 121 days between New York and San Francisco, 15,925 miles, an average of $131\frac{1}{2}$ miles a day.


From New York towards San Francisco

Remarks, Wed. 2nd day of June 1869

This day commences with pleasant weather & light breeze from the Southward.

Day ends foggy with mist.

Took the anchors on deck & put chains below.

Pumps regularly attended.

1 Day out.

Course	Distance	Diff of Lat	Departure	Lat by D R	Lat by Ob	Variation	Diff of Lon	Lon In	Lon by Ob
S 76° E	125	30.2	121.3	39.54	—	9° W	158	71.12	

Remarks, Thur. 3rd day of June 1869

First part foggy with a light breeze from the Southward.

Middle part thick foggy with mist.

Day ends thick hazy weather with light baffling winds.

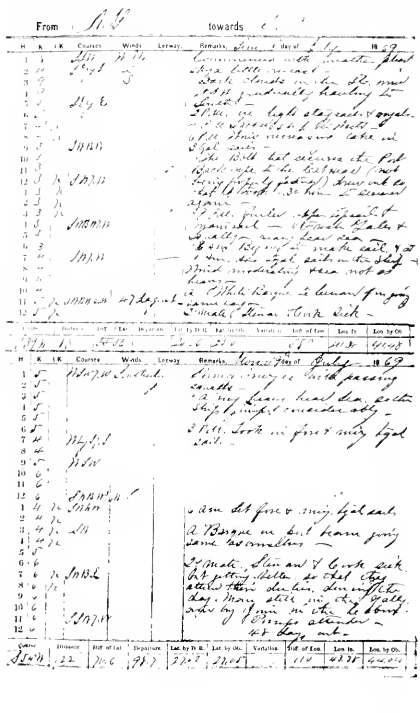
Busy rigging stud sail gear.

Pumps attended.

2 Days out.

(Using the patent log)

Course	Distance	Diff of Lat	Departure	Lat by D R	Lat by Ob	Variation	Diff of Lon	Lon In	Lon by Ob
S 75° E	114	28.4	110.4	39.26	—	9° W	142	68.49	

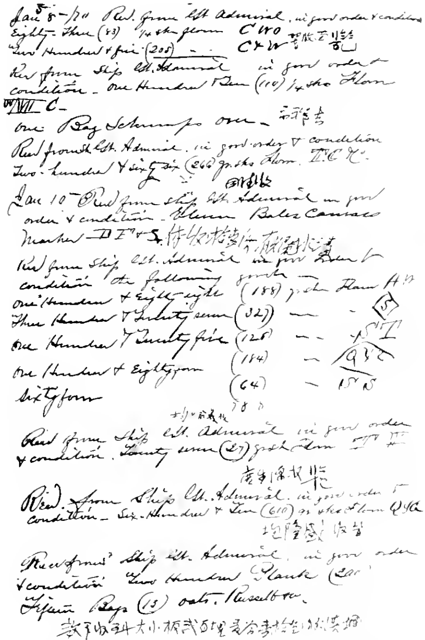

From N.Y. towards

Remarks, day of July 1869

47 days out

48 days out.

Course	Distance	Diff of Lat	Departure	Lat by D R	Lat by Ob	Variation	Diff of Lon	Lon In	Lon by Ob
S 54° W	122	70.6	98.7	27.02	27.05		110	43.38	44.04


Jan 8—/70 Recd. from Gt. Admiral, in good order & condition Eighty-three (83) 1/4 sks flour
Two Hundred & five (205)
Recd from Ship Gt. Admiral in good order & condition — One Hundred Ten (110) 1/4 sks Flour
One Bag Schnapps over —
Recd from Gt. Admiral in good order & condition Two hundred & sixty six (266) qr. sks Flour
Jan 10 Recd from ship Gt. Admiral in good order & condition Eleven Bales Canvass
Recd from Ship Gt. Admiral in good order & condition the following goods — One Hundred & eighty eight (188) qr. sks Flour
Three Hundred & Twenty seven (327)
One Hundred & Twenty five (125)
One Hundred & Eighty four (184)
Sixty four (64)
Recd from Ship Gt. Admiral in good order & condition Twenty seven (27) qr. sks Flour
Recd. from Ship Gt. Admiral in good order & condition — Six Hundred & Ten (610) qr. sks Flour
Recd from Ship Gt. Admiral in good order & condition Two Hundred Plank
Fifteen Bags (15) oats.

A page from the receipt book of the first mate of the Great Admiral, showing some cargo delivered at Hong Kong, principally flour laden at San Francisco in October and November, 1869. On this second section of her maiden voyage, she arrived at Hong Kong on Christmas Day, 1869, 37 days from San Francisco, having sailed 7079 miles, a daily average of 192 miles. Note the many Chinese character signatures.

Hong Kong, was her master until he reached New York from Manila in December, 1886.

Captain Thompson was born at Winterport, Maine, September 10, 1834, and early in life took up seafaring. In 1857 he was in command of the ship Sportsman trading largely with the Orient and continued in her until her sale in 1864. In 1861 Captain Thompson's ship was chartered by the United States Navy for use as an ordnance ship. She did duty at Pensacola and other ports that were being blockaded and was in at the taking of New Orleans. The following is a copy of a letter written on the flagship Hartford of the West Gulf Blockading Squadron, off Pensacola, to the Secretary of the Navy by Rear Admiral D. G. Farragut, dated April 29, 1864.

"Sir: Captain Thompson commanded the ship Sportsman, an ordnance storeship in my squadron, for upwards of two years and it gives me pleasure to say that he was always prompt in getting his vessel from place to place as required; kept her in good order and was at all times ready to supply the wants of the squadron. Captain Thompson is a seaman and a gentleman and would no doubt make a good volunteer officer in the Navy. Should it be his wish to enter the service, I would cheerfully recommend him to the favorable consideration of the Department."

Captain Thompson, however, seems to have preferred mercantile rather than naval service for we find that after the sale of his ship Sportsman, he was master of the Peruvian belonging to W. F. Weld & Co., engaged principally in the East India trade. In 1872 he was transferred to the three deck, 1800-ton ship Enoch Train, another of the Weld fleet. This ship had been particularly unfortunate on several previous voyages, having been forced to put into ports badly damaged by stress of weather, and was being called an unlucky vessel. Captain Thompson, however, embarked on his voyage from New York for Hong Kong without misgivings although the sequel proved that the passage came nearly being the last for both vessel and crew. When nearing the China coast the Enoch Train encountered a typhoon and was thrown on beam ends; the cargo shifted and the masts carried away, but fortunately the hull remained tight. After a lull of a few days another typhoon came on and the ship being still entirely unmanageable, was nearly rolled over in the trough of the terrific seas. By a miracle she did not founder and eventually a passing Chinese gunboat came along and took word of the distressed ship into Hong Kong, when a steamer was sent out and towed her into port.

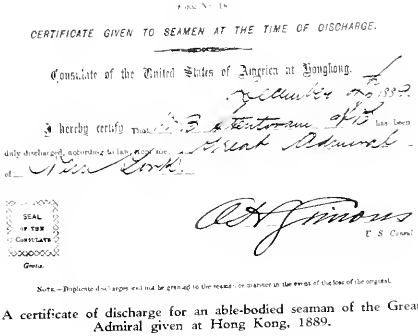
After undergoing extensive repairs, Captain Thompson navigated his ship to New York where she was sold to parties in Glasgow and went under the British flag. Captain Thompson then took the Great Admiral and during his thirteen years in that ship he was very successful and made many fast passages. In 1886 he relinquished command and retired from sea life. For some twelve years thereafter he was employed in the Weld office in Boston. In 1899 he went to his birthplace, Winterport, and repaired his father's homestead in which he lived until he passed away on October 31, 1905.

The coincidence is noted that Captain Thompson's last command was named in honor of Admiral Farragut under whom he had served years before with his ship Sportsman.

Captain James F. Rowell

Captain James F. Rowell, who succeeded Captain Thompson in the Great Admiral in 1886, was born at Frankfort, Maine, on March 5, 1842. His ancestors were English and came to America with the Pilgrims, settling in Massachusetts and Maine. He went to sea at the age of sixteen, making coasting voyages. At eighteen he engaged as seaman on the ship John H. Jarvis at New York for New Orleans with cargo and passengers. At the southern port a cargo of corn, flour,

(Continued on Page 27, Blue Form)


Form No. 18

CERTIFICATE GIVEN TO SEAMEN AT THE TIME OF DISCHARGE.

Consulate of the United States of America at Hongkong.

December ... 1889

I hereby certify That ... has been duly discharged, according to law, from the Great Admiral of New York

SEAL OF THE CONSULATE

Gratis.

U. S. Consul

NOTE.—Duplicate discharges will not be granted to the seaman or mariner in the event of the loss of the original.

A certificate of discharge for an able-bodied seaman of the Great Admiral given at Hong Kong, 1889.

Fundamental Principles in Materials Handling

A Mechanical Engineer Sets Forth Some Important Facts and Principles Underlying the Economies of Terminal Equipment and Management that Should be of Great Interest to Ship and Dock Operators

By Harold Vinton Coes*

THE public is slowly beginning to appreciate the fact that the cost of living is intimately related to the cost of production and of distribution, and that one of the big factors in the cost of production and of distribution is the enormous toll due to handling, picking up and putting down, and rehandling the materials of agriculture and industry. Think of it! A manufacturer of agricultural implements in a modern plant estimated that he had to handle 108 tons of materials for every ton of finished product f.o.b. his plant!

Before the war the railroads normally handled about 1,000,000,000 tons of miscellaneous freight annually, and the seaport terminals handled about half as much more as package freight, or 500,000,000 tons. It has been estimated that adequate materials-handling devices could handle this tonnage at a reduction in cost of $400,000,000 annually. If this saving could be distributed equally per family it would represent an annual saving of $16 for every family in the United States. What this saving might be if the enormous tonnage handled annually in industrial plants could be similarly reduced in cost is problematical; that it is several times $16 per family per year is unquestionable. I have estimated it at $400 per family per year.

A survey made for a leading trade paper a year or two ago indicated that the materials-handling labor cost to American industry was 22 per cent of the total annual payroll of the American manufacturing industries in 1923, which was $14.017.107.000; and 22 per cent of this amounted to $3,084,000,000.

Eugene B. Clark estimates that manufacturers in this country pay for moving materials within their plants 80 per cent of what they pay for freight, express, and parcel post annually.

It can be taken as axiomatic that nothing is where you want it or where it must be finally placed in so far as raw materials are concerned, and usually in so far as finished goods are concerned, so that the pyramiding of tolls on account of the handling of the rawest of raw materials to the most finished of finished products is enormous.

Some Important Facts In Materials-Handling

Suppose we set down the known facts such as will guide us properly to a correct solution of the materials-handling problem and the right use of materials-handling devices.

New-Plant Operation. In a new industrial undertaking materials handling is an important factor in determining:

(a) Plant location
(b) Plant layout, present and future
(c) Departmental layouts and sequences
(d) Production equipment, layouts, and sequences
(e) Plant output
(f) Operating costs per unit of product.

Obviously for a minimum investment and lowest cost of operation consistent with the present state of the art the new plant should be so located as to take full advantage of all the natural advantages available. The materials-handling methods and devices should be sufficiently worked out at the time the plant is designed so as to make them an integral part of the design.

Existing Plant. In an existing plant the proper selection of adequate materials handling equipment will

(a) Increase the output
(b) Lower the cost
(c) Facilitate administration and management.

Important Principles

Every element of materials-handling equipment should be selected not only to perform the work at present but in most instances, except in specifically isolated cases, to fit into the program conceived for the ultimate plant or the rehabiliation of the existing plant.

Eliminate all unnecessary handling operations; perform all necessary handling by gravity wherever econimically possible.

Choose the methods and equipment for performing the necessary handling operations that will result in the lowest cost.

Choose standard proved and tried equipment wherever possible.

In a new plant the materials-handling devices and equipment should for lowest investment costs be an integral part of the plant in many instances.

Provide for flexibility so that a failure of any of the materials-handling devices or equipment will not shut down the plant.

Before arranging for any system of shop or plant transportation a study should be made to see if the departments can be so re-arranged as to permit minimum travel in logical sequence with the minimum of retrogressive movements. In other words, do not transport materials any farther than is absolutely necessary.

It stands to reason that the return on the investment should be such as to justify it. Many of the progressive companies have a fixed policy that provides for the scrapping of any piece of equipment or process whenever it can be shown that the proposed new piece of equipment or process can earn 20 to 25 per cent. Obviously this is good business.

The return should provided for adequate fixed charges. In order to show the proper return on the investment, provision should be made in calculating fixed charges for interest, taxes, depreciation, insurance, and obsolescence.

What Materials-Handling Programs Will Accomplish

Properly selected and installed handling equipment will:

1. Permit transferring to the capital account of the portion of overhead that is composed of indirect labor
2. Reduce the manufacturing cycle
3. Reduce the process inventory
4. Speed up, coordinate, and stabilize production
5. Facilitate the obtaining of accounting and production data
6. Substitute automatic mechanical scheduling for the former complicated expensive schedule and production systems

*Ford, Bacon & Davis, Inc., New York. Abstract from a paper presented at the First National Meeting of the A.S.M.E. Materials Handling Division, Philadelphia, April 23 and 24, 1928.

7. Govern the layout of new plants and improve the performance in existing plants.

W. F. Merrill, president of the Lamson Company, makes this statement: "The usual concept of industrial transportation problems has been confined to the man-saving, the labor-saving functions. True it is that this one element alone has already effected such great economies as amply to justify the time and thought spent on its development, but without minimizing the self-evident values of this one economic function, the broad principle behind the movement still seems to be but imperfectly understood and insufficiently applied to use.

"The industry of the future will in my opinion devote as much time to a scientific coordination of its manufacturing and materials-handling elements in their relation to production flow as it now devotes to the invention, design, and manufacture of its product and the machines that make it.

"Synchronized material movement and the grouping of production processes are important principles in the proper working out of the transport science in production. Systems of conveying properly applied may enhance production 10, 25, or even 50 per cent with the same man power and machine equipment.

"In the travel of material through the processing route it is on the average worked on less than one-third and often but one-sixth of the time. Work in process is thus often the graveyard of profits."

Some Rules for Securing Materials-Handling Economies

Mr. McLain of the General Electric Company sets up the following rough list of instances where economies may be hoped for in the use of machinery instead of men, where said men are unaided by any mechanical device:

1. Where three or four men are working together on one job for a couple of hours at a time, even though the work is not performed more than three or four times a week
2. Whenever a man has to lift anything from his feet to a point above his head
3. Whenever a man has to lift more than 50 lb. from his feet to his shoulders
4. Whenever a man has to lift more than 100 lb. from his feet to his waist
5. Whenever a man has to lift more than 150 lb. from his feet to his knees
6. Whenever a man has to stand in one place steadily moving material for over 30 min.
7. Whenever a man has to move material sideways more than 6 ft., that is, two steps
8. Whenever a man or a group of men, although moving around in a small radius, has to move more than 10 tons of material per hour.

Selection of Equipment

One of the things that is the cause of much subsequent economic woe in the selection of materials-handling equipment for a specific set of conditions is confusion between service and mere mechanical or electrical performance. A piece of equipment may be mechanically perfect, yet its selection for a given set of conditions be an economic crime because it is not designed to function so as to meet all of the conditions imposed and therefore operates at a loss.

The equipment companies are somewhat to blame for this situation. Rarely do their sales representatives know anything about the equipment of other manufacturers unless they are directly competing along absolutely parallel lines. It is my firm belief that the equipment manufacturer in the long run would have more friends and build up a more substantial good will if they would refuse orders as well as take them; in other words, if they would insist on selling service and serviceability rather than pieces of equipment.

Comparative Costs

There is a serious lack of fundamental data as to costs of operation and a confusion of these costs. The Materials Handling Division of the A.S.M.E. is endeavoring to act in a coordinating and collecting capacity with respect to this phase of materials handling, and has devised and set up standards and formulas for correctly comparing dissimilar methods; this is nothing more than the application of mathematics to economics.

Plant Transportation

We sometimes fail to realize what transportation costs. Why? Because some accountant once said that it was an overhead charge, and therefore it is buried in that sink hole labeled "overhead." Manufacturers can tell you exactly what their raw materials cost, how much they use, what their losses are, and similarly with labor; and yet very few have set up the machinery to know what their shop transportation actually costs them.

Reliability of Equipment

Tried and proved materials-handling equipment produced by reliable manufacturers is just as dependable in performance, and in freedom from breakdown, and just as economical in operation and maintenance as the productive equipment proper. Few charges to the contrary can be sustained. If breakdowns occur, if maintenance is high, it is owing to a lack of care, to improper selection of the units in the first place, and to overloading the equipment.

Conclusion

Economy in moving material, then, is secured as a rule by not moving it by hand.

The cost of production of most products is almost directly proportional to the cost of handling the various materials, direct and indirect, used in the process, be it extraction or manufacturing industry.

Material in traveling through the processing route is worked on (i.e., direct labor operations) on the average from 30 to 40 per cent of the possible time, and frequently only 15 to 20 per cent, so that it behooves us to analyze our work-in-process accounts and see what is buried in them and what can be done to increase the turnover. Proper materials-handling programs and equipment are usually the answer.

From P.M.R. Twenty-Five Years Ago

"We learn that the North Pacific Steamship Association has decided to continue during the month of April the current rate of $4 for flour and wheat to the usual ports of call in the Orient, with a $4.50 rate to Shanghai. . . . The lowest conference rate to the Orient for last year was $3, and the highest $5."

(The present charter rate for wheat is very little over $5.—Editor.)

Honolulu Harbor Plans

Extensive Developments Planned to Meet the Present and Future Needs of Hawaiian Trade

AN imposing plan for the development of Honolulu harbor by territorial and federal agencies has been formulated by the Board of Harbor Commissioners of Hawaii and transmitted to Governor Farrington. It is so comprehensive, and would require so much time and money, that the board, though fully approving it, regards it as an ideal to be attained within twenty-five or forty years and not as anything capable of immediate consummation.

For years the veriest novice has realized that Honolulu harbor is exceedingly cramped. Its condition has been accentuated by the construction and purchase of more and larger vessels for both island and transpacific trade. New wharves have been built but the net increase to harbor facilities thus made has not been so great as it might have been since older wharves are long past their prime and require reconstruction or additions. Even if wharf facilities were adequate, however, the harbor would be unsatisfactory, because it is narrow and an awkward place for large steamers. This was abundantly demonstrated within the last few months, when the steamship Belgenland, calling on an around-the-world cruise, had some little difficulty in departing, although she fortunately suffered no damage. Moreover various persons, among whom is Captain Robert Dollar, have preached the gospel of a minimum depth of forty feet, as compared with the existing thirty-five; but it does appear that, for the present, at least, thirty-five feet is adequate, provided silting is prevented.

In the accompanying engraving a broad view of the proposed improvements may be obtained. The reader will observe on the right (that is, the east) Kewalo, and on the left (the west) Kapalama Basin, to both of which reference will be made hereafter. The engraving is too small for projected wharf improvements to be shown.

Tremendous Dredging Operations

The extent of dredging is the most impressive part of the program. That the northeastern side of Sand Island should be removed has long been manifest; this work is certain to be done, and probably within the relatively near future. Likewise the completion of a 400-foot channel into Kapalama Basin has been assured, a channel of 100-foot width having already been dredged and a further appropriation of $775,000 being provided in a bill before Congress. But a new channel from Kapalama Basin directly to the sea has received no formal indorsement heretofore; and the Board of Harbor Commissioners also would increase the width of the Honolulu-Kapalama channel to 1000 feet. All this would supply a great mass of dredging spoil, which the board would use to fill extensive areas to seaward, as shown in the engraving.

As was stated in Pacific Marine Review some months ago, a channel will certainly be excavated from Pearl Harbor into Kapalama Basin, this in order to afford Pearl Harbor two exits instead of the one it now has. Notwithstanding extensive dredging now in progress at Pearl Harbor, both within the lochs and in the channel, that naval base will never be satisfactory until it possesses two openings, for the obvious reason that a harbor with one narrow approach is exceedingly vulnerable in time of war. On this situation the proposed channel from Kapalama to the sea has some considerable bearing, since it would offer men-of-war a third passage to deep water, the second being through Honolulu proper. Some doubts have been expressed, however, regarding the possible adverse currents that might arise in Honolulu harbor as a consequence of the channel from Kapalama to the sea; but the merits of these misgivings would be determined before any work was done.

Plan of the Harbor Board

Here follows a summary of the recommendations of the Board of Harbor Commissioners to Governor Farrington:

Soon after the organization of the board in 1911, a general plan for wharf improvement in Honolulu was drafted and adopted; all that work has been completed with one exception, a line of railroad around the waterfront to connect the territorial wharves with the Oahu Railway, the tracks of which are shown in the upper left of the engraving. At this time, the board says, it does not appear wise to press for rail connections to territorial wharves, inasmuch as relief may come through other developments. But Honolulu harbor should be completely utilized, and Kapalama and Kewalo further developed. This, then, is the board's program:

1. Reconstruct Pier 15 on approximately the present site and build a reinforced concrete wharf and shed; continue the pile structure to the combined Piers 16 and 17 (as proposed), so that the new Pier 15 may have connection with the Oahu Railway.

2. Condemnation by the territory of Pier 17 and half of the slip between Piers 16 and 17; amalgamation of Piers 16 and 17; this would create a slip 200 feet wide between Piers 15 and 16, a wharf 220 feet wide, and a slip 200 feet wide between the proposed new structure and Piers 19 and 20. Items 1 and 2, says the board, would afford berthing accommodations at one time for three steamers 700 feet or more in length. The combined Pier 16 and 17 would be of steel and concrete.

3. On the present sites of Piers 12, 13 and 14 construct two new wharves for the steamers of the Inter-Island Steam Navigation Company, which are rapidly increasing in size.

4. Construct a bulkhead retaining wall across Kapalama Basin to receive dredging spoil from the 300-foot channel between Honolulu and Kapalama. Reference has already been made to the pendency of a bill in Congress to provide for this dredging.

5. Reconstruct and lengthen Pier 6 to 650 feet "when certain federal projects are in course of operation."

6. Same for Pier 7. These piers would be used by the new liners the Matson Line will build for its Australian service.

7. Acquire various land areas in Kapalama Basin. An appropriation of $900,000 for purchase of lands owned by the Oahu Railway was included in the budget submitted to the 1929 legislature. "It is apparent," Governor Farrington has been quoted as saying, "that if the territory does not buy this land and develop har-

bor facilities there, private interests will do so, leading to undesirable competition between public and privately-owned wharves."

8. Federal projects: Dredge Sand Island as indicated on the sketch and deposit spoil on the seaward side, as shown, filling a large area of mud, stones and coral flats and reef. This made land, says the board, probably would make an excellent aviation field for the federal government and at low cost. Much sea wall would have to be built.

9. With the removal of a portion of Sand Island, as suggested, Honolulu harbor would be exposed to the southerly gales of winter; it would, therefore, be necessary to construct a sea wall on the eastern side of the channel and fill the area with dredging spoil or, perhaps, rely on the action of the sea to fill it. The area here under consideration is labeled "125 acres" on the sketch.

10. Control Nuuanu Stream, which empties into the harbor and deposits silt therein, particularly between Piers 15 and 16 and Piers 16 and 17, but also elsewhere, causing a general shallowing.

11. Widen Kewalo channel to 400 feet and deepen it to 30 feet at mean low water, so that lumber carriers could discharge at Kewalo and relieve congestion in Honolulu harbor proper; construct on the north side a heavy rock wall, filling in the area thus inclosed.

12. Construct whatever improvements may be required after the Kapalama Basin retaining wall is in place and the fill of sixty-five acres completed.

"It should be borne in mind," says the board, "that the value of land reclaimed under suggested projects Nos. 4, 8, 9, and 11 will far exceed the cost of dredging and retaining wall construction." And further that "the numbering of the suggested projects does not necessarily imply that the improvements would be recommended to the legislature in such order."

Reconstruction of Piers 12, 13, 14 and 15 must take precedence. They have been exposed to the ravages of termites above water and of teredos below, and when rebuilt will be of steel and concrete instead of wood. Large wooden structures, as Hawaii has discovered to its sorrow, are grave liabilities; doubly so when they rest on wooden piling.

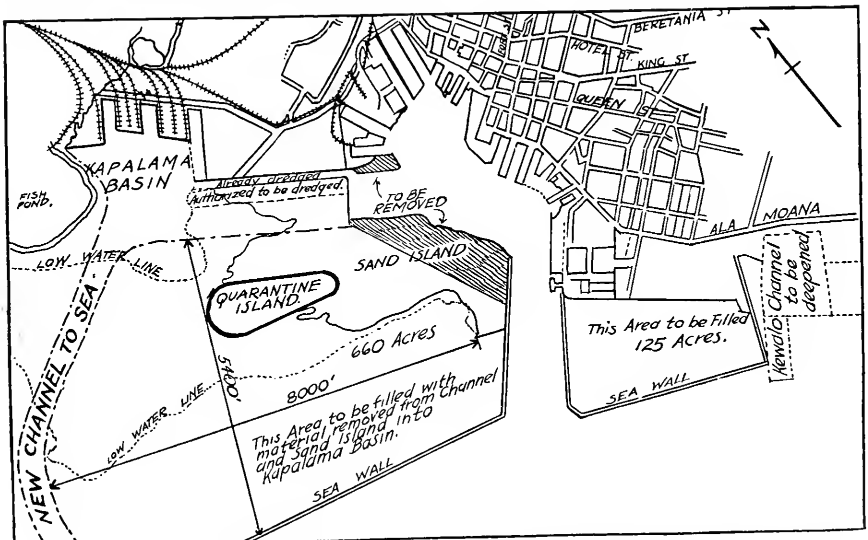
The program of the harbor board recognizes the fact that industrial development of Honolulu must be to the west, toward Kapalama, near which are already situated tanks of the oil companies, slaughter houses, the rail head of the Oahu Railway, and (of most consequence) the pineapple canneries. Harbor and industry will move together, and in their train will follow a number of other changes.

Governor's Message

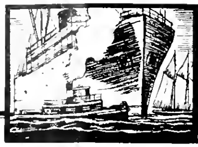
In his message to the 1929 legislature, Governor Farrington discussed harbor work as follows:

"The advantage of the development of Kapalama Basin is impressive during the pineapple season. The wharf authorized in that section of the harbor has been completed. The pineapple crop was handled without difficulty and a satisfactory demonstration was made of the wisdom of this project. Future developments in this area should undoubtedly include equipment for the handling of cattle coming to Honolulu from the outside islands.

(Continued on Page 53)



Sketch map showing improvements projected for Honolulu Harbor. This Harbor Board program is estimated to take from twenty-five to forty years for completion.



Trade, Traffic, and Shipping

Cargo Handling Facilities at Philippines Ports

Insular Government Establishes Policy of Constant Improvement to Meet Increasing Export and Import Needs

By Vicente Aldanese,
Chairman and Manager, Manila Harbor Board, and Insular Collector of Customs, Manila, P. I.

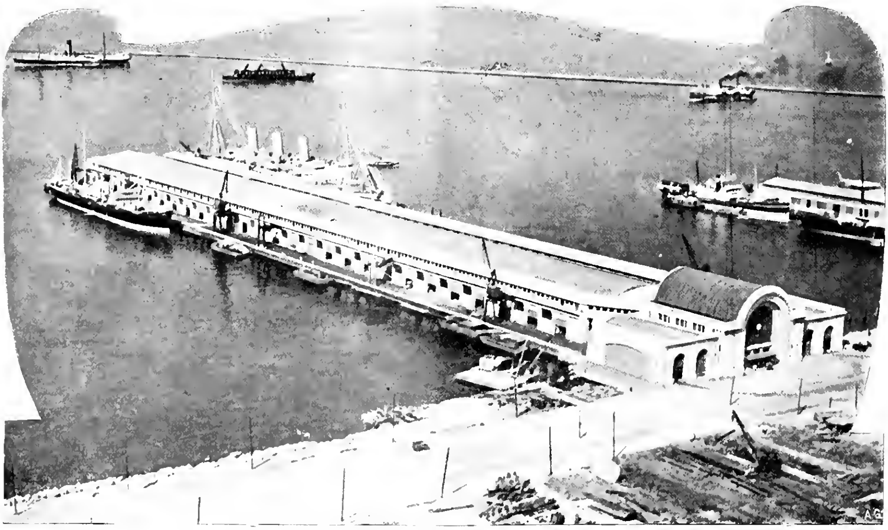
IN the January 1929 number of the Pacific Marine Review, there appears an article entitled "An American Freighter In the Orient" by Fred B. Michelson in which it is inferred that docking facilities at the port of Manila are inadequate to the needs of the port, and that delays in loading and unloading vessels at Cebu, Iloilo, and Tacloban are occasioned by lack of adequate lighterage facilities and land transportation at these latter ports. A photograph is shown of a slow-moving carabao and primitive cart to further enlighten the reader as to the antiquated methods of transporting sugar to the docks.

It is believed that a measure of injustice has been done to the ports in question. The purpose, therefore, of the remarks submitted herewith is to correct any erroneous impressions which the publication of Mr. Michelson's criticism may have created in the minds of readers with respect to docking and cargo handling facilities at open ports of the Philippine Islands, particularly of the port of Manila.

Manila

The port of Manila is now recognized and freely acknowledged by masters of vessels and shipping men familiar with the shipping conditions of the port as one of the best and most efficiently operated ports on the Pacific. Adequate docking facilities are available for all present needs of the port. The piers are equipped with modern electric cargo handling machinery, and the port has established an enviable reputation for efficient handling of cargoes and rapid turnaround of vessels. These facts are so well known and established that it is strange Mr. Michelson did not make an exception of the port of Manila at least in his criticisms of Philippine ports.

The Philippine Government owns and operates, under contract with the Manila Terminal Company, Inc., three concrete and steel piers and one wharf at which nine large transpacific vessels and one or more vessels of lighter draft may be docked simultaneously. The Unit-



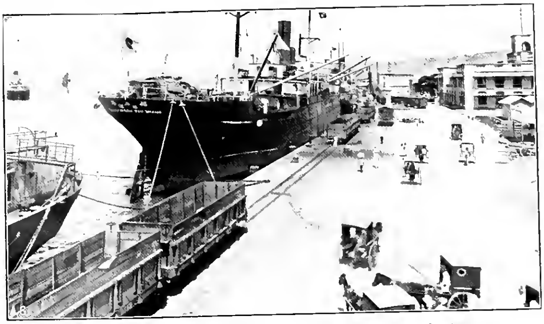
Interesting airplane view of Pier 7, Manila Harbor, breakwater wall in background. This pier is 1480 feet long and 240 feet wide. Six portal type electric cranes serve the ship's berths. Twenty-three 2 and 3-ton electric cranes serve interior of the pier shed.

ed States Government owns and operates one pier with two berths for army and navy vessels, and this pier is available for commercial vessels in case of need. It is rare indeed that any vessel desiring a berth at a pier may not be immediately accommodated. Docking facilities are quite adequate to present needs of the port, and vessels do not have to wait for berths to be vacated. If a certain particular berth is desired, it might happen that a vessel would have to wait for that berth to be vacated. This may happen at public docks at any port in the world.

All foreign vessels having more than 100 tons of general cargo to discharge dock at the piers in compliance with customs regulations. Vessels with bulk cargo to discharge, such as coal, lumber, case oil, gunny sacks, flour, or rice, and vessels loading bulk cargo, such as copra, coconut oil, copra cake, hemp, sugar, or leaf tobacco, prefer to anchor in the harbor and handle such cargoes by lighters. The cost of pilotage to the piers and the pier berthing charge is thus saved, lighters may be moored on both sides of the vessels, and discharging and loading may be accomplished simultaneously.

Manila has the advantage of being situated at the mouth of a deep tide-water river, and practically all importers and exporters have their warehouses and storage spaces on the river. It is therefore much more convenient and less expensive to handle bulk cargoes by lighters. This accounts for the fact that Mr. Michelson saw a number of vessels anchored in the harbor and working cargo by lighters. They were not waiting for docking space at the piers. Sufficient lighterage is available at all times and at exceptionally reasonable cost, including tank lighterage for coconut oil. Fuel oil in bulk is discharged at a special wharf built for this purpose and also at the piers which are piped for this purpose.

Private stevedoring companies are prepared at all times to handle cargoes without delay and at reasonable cost. Heavy lifts up to fifteen tons in weight may be handled at Pier No. 7 by electric pier cranes, and heavier lifts may be handled by floating equipment. Excellent and sufficient labor is available at all times, and cargoes are worked on Sundays, holidays, and during night hours without interruption. Labor strikes, the bugaboo of many ports, are practically unknown.



Portion of the wharf at the Port of Cebu, Philippine Islands.

Manila is proud of its excellently constructed and equipped piers, of the rapid and efficient manner in which cargoes are handled, day and night, of the quick turn-around of vessels, and of the exceptionally moderate port charges and costs to vessels and shippers. Present port facilities represent a constructional cost of 31,000,000 pesos to the government, and no effort is made to operate the port facilities on a profit-making basis with the view of reimbursing the government for its outlay. All docking facilities are publicly owned and are operated by the Manila Harbor Board—a government board whose members are selected because of their knowledge and experience in shipping problems. The Board prepares and publishes for free distribution a "Port of Manila Year Book" in which the Board aims to cover all matters of interest to ship operators and shippers as well as much general information of the Philippine Islands.

Cebu

It does not appear that Mr. Michelson had much cause for criticism on account of delay to his vessel at the port of Cebu. He says "Here, as at Manila, flour was discharged into lighters on one side while copra and hemp were taken aboard from the wharf." He states further that some delay was caused by the lack of sufficient lighterage for unloading and by inadequate truckage for cargo to be loaded from the wharf. It must be conceded that immediate and simultaneous loading and unloading of cargo is of great advantage to the carrying vessel; and the fact that this advantage was enjoyed at Manila and at Cebu (and probably at Iloilo) speaks well for the cargo handling arrangements at these ports. Probably the loss of time because of lack of sufficient lighterage and land transportation at Cebu was more than made up by the gain of time in simultaneous discharging and loading.

It is admitted with regret that the port of Cebu has not yet been provided with sufficient deep-water wharves for the needs of the port. The deep water section of the present wharf is 1800 feet long and is served by terminal trackage of the Philippine Railway of Cebu. However, very extensive improvements are now under way and 4,000,000 pesos are being expended in lengthening the wharf and constructing three covered concrete piers. With the additional wharfage and piers, the port will be well provided with sufficient docking space. There has been no complaint made as to the inadequacy of lighterage facilities at Cebu, and land transportation is almost entirely comprised of motor trucks in addition to the railway trackage.

Iloilo

The port of Iloilo has not yet been provided with wharves or piers for deep draft vessels. Such vessels anchor at the mouth of the river and in the harbor and their cargoes are handled by lighters. However, a bond issue of 4,350,000 pesos has been floated and a contract has been let for the construction of deep water wharves and a covered concrete pier. With the completion of these improvements, which will be accomplished in the very near future, Iloilo will be provided with excellent docking space. Lighterage facilities are excellent at Iloilo, and it is rare that any delay to vessels is caused through lack of sufficient lighterage. Labor conditions are also excellent at this port.

Portion of the port and harbor of Tacloban, Philippine Islands.

Tacloban

Tacloban is not a port for the entry of foreign vessels. It has only been in recent years that foreign vessels have been permitted to enter this port by special permit of the Bureau of Customs. It is, however, an important port for coastwise shipping and port improvements have been designed only for light draft vessels in the coastwise trade. Until Tacloban shall have been made a port of entry for foreign vessels, criticism as to its lack of facilities for deep draft vessels is not in order.

In concluding these remarks, we wish to state that a port advisory committee is now studying the needs of all ports of the Philippine Islands. The government is deeply and earnestly interested in providing adequate shipping facilities at all important ports, both entry and non-entry. The foreign commerce of the Philippines has been growing very rapidly during the past twenty-five years and the government is exerting its greatest endeavors to provide adequate shipping facilities for foreign shipping at ports of entry. The bulk of present shipping is carried on through the ports of Manila, Cebu, Iloilo, Zamboanga, and Davao; and major improvements have been concentrated at these ports.

Alabama's State Terminal

State-Owned Piers at the Port of Mobile Greatly Facilitate Movement of Intercoastal Commerce Through that Port

THE completion of the State of Alabama's port terminal system at Mobile has been an important factor in improving the intercoastal commerce of the Alabama Gulf ports and in the distribution of Pacific Coast products in the territory contiguous to Mobile.

Airplane view of Piers A, B, and C of Alabama State Terminal at Mobile. The concrete warehouses shown on these piers provide more than 20 acres of covered storage. Classification yards immediately at rear of piers.

The same influences that have been at work over a period of twelve years or more to bring about the building of the Alabama State Docks, at a cost of ten million dollars, have also wrought changes in the rail rate structure to further facilitate the movement of intercoastal commerce through Mobile, and to give that port the advantages to which it is entitled by reason of its geographical location. The rate on dried fruit, for instance, recently has been so revised that the new class rates on this important item of intercoastal traffic apply to various points, based on distance.

Mobile's Pacific Coast trade is primarily founded on the shipment of iron and steel products from the Birmingham, Alabama, mineral and manufacturing district. Included in this movement are large quantities of iron pipe and an occasional shipment of coke. Though German competition and cheap ocean freights forced the Alabama coal and coke producers to find other markets in the past, the situation has been remedied by a recent reduction of rail rates to the port, and it is expected that the foreign competition will be met. Manifests, westbound, show increasing shipments of machinery and other high class metal goods manufactured in southern centers, of which Chattanooga, Tennessee, is one of the growing points of production.

Four steamship lines are regularly engaged in this Mobile and Pacific trade. One steamer sails from the Alabama seaport to the Pacific every three days throughout the year, on an average, and one of the lines reports having to shut out cargo, westbound, although loading at Mobile only.

Birmingham steel and iron constitute a ready-made commerce between Mobile and the Pacific, by reason of the great demand on the western coast for such commodities, the proximity of Mobile to the point of origin, its rail and Warrior Barge line transportation therefrom, and the further fact that Mobile is the nearest important Gulf port to the Panama Canal. The great effort of those engaged in this commerce, therefore, has been directed towards obtaining freight of lighter weight in proportion to bulk, to obtain a better balanced cargo, westbound, and towards increasing the volume and variety of eastbound cargoes.

While no special facilities are required for transferring steel rails, iron pipe, and freights of that character from rail and river carriers to steamers, the wide slips at the State Docks and convenient track arrangement on the apron wharves at the several piers permit vessels to load from both cars and barges at the same time, giving the greatest possible dispatch, regardless of wind or weather.

It is in the handling and storage of such freights as dried fruit, canned fruit and salmon, beans, flour, sugar, and other commodities that must be protected from the rain, stored, and reshipped that the steel-concrete, sprinkler-protected warehouses, with a total protected space of more than twenty acres, have assisted in building new business for the steamer lines.

The typical slip of the State Docks system is 1600 feet long and 350 feet wide; while the standard pier is as long as the slips and 560 feet wide. The foundations of the entire structure are of pre-cast concrete piles and the superstructure of concrete and steel. The apron wharf on each side of the piers is 42 feet wide, carrying three tracks with crossovers at frequent intervals to permit movement of cars at shipside without interference with other cars in the process of loading or discharging freight. The wharves are protected with a system of creosoted piling, and vessels lying in those deep wide slips are completely bottled up against all danger from storm or hurricane.

One of the piers is open, with almost unlimited space behind it for the storage of lumber, timber, piling, stringers, or other freight that does not require protection from the weather. Like the other structures, it is high above the highest storm tide levels. One of its features is a 75-ton derrick, used for the handling of items too heavy for ship's tackle.

Periodically, there is a considerable movement of Douglas fir lumber, principally stringers for railroad construction work, from North Pacific ports through the port of Mobile to interior points, and the movement of red cedar shingles by the same routes is practically continuous, usually loaded directly from ship to waiting cars.

A flour blending, handling, and fumigating plant has been provided at the State Docks and has received and handled some flour from the Pacific coast. Though the volume of this traffic has not been large, it is well to know that such facilities are available in event of need. The bulk materials handling plant, capable of handling coal or ore from storage, rail, or river carriers to ship at the rate of 600 tons per hour, has not been used to any great extent for the shipment of Birmingham coke to Pacific ports; but with the new rates in effect it is expected that shipments of coal and coke will increase.

General William L. Sibert, one of the engineers appointed by President Roosevelt to build the Panama Canal, and who is credited in histories of canal construction with the building of Gatun dam and locks and other important features of that monumental work, is also the builder of the Alabama State Docks, being Chairman-Chief Engineer of the State Docks Commission. Having completed the work of construction, he remains on the job as general manager, engaged in straightening out the rate structure and in otherwise developing business for the port. Recently, while engaged in research work in connection with Boulder Dam, to which he had been assigned by President Coolidge, General Sibert conferred with numerous Pacific Coast firms engaged in shipping, and on his return to Mobile predicted early adjustments that will greatly increase the commerce between Mobile and that region west of the Panama Canal, on both continents.

Efforts of the Docks Commission to establish tonnage producing industries on state-owned riverfront property and on the canal which traverses the docks site have met with considerable success. One of the new plants is the kraft paper mill of the International Paper Company, which will make paper from Alabama pine wood pulp. Another plant, not on state property, is the wire cable manufacturing plant of the General Cable Company, which eventually will work with copper from the company's mines on the west coast of South America.

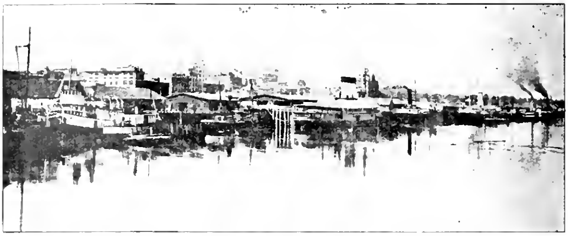
(Continued on Page 23, Blue Form)

Panoramic view of slip between Piers A and B, Port of Mobile, with a number of intercoastal steamers berthed. Note facilities for loading from both pier and barge alongside. Slip is 1600 feet long and 350 feet wide.

Our Canadian Neighbors

Shipping Operations Flourish on the British Columbia Coast, and Vancouver Shows Tremendous Gain in Exports

THE coast of British Columbia, our Canadian Northwest neighbor, presents a very fascinating field for coastwise steamship operation. The commercial development of this territory on a large scale is comparatively recent, and steamboating has had a very prominent place in that development from the first.



View of the principal waterfront of Vancouver, British Columbia, taken twenty-five years ago. Note the contrast between the flimsy wharf construction of those days and the modern grain terminal at this port as shown in the picture at the bottom of this page.

Among the pioneers was the Union Steamship Company of British Columbia. This firm has for over forty years been servicing the ports and outlying coast settlements of the province as far north as Prince Rupert, British Columbia, and Hyder, Alaska. Its red-funneled, busy coastwise fleet is a very intimate feature of the scenery along the Pacific Coast of British Columbia. This coast largely consists of practically inland waterways, protected by large and small islands on the ocean side and cut up into very rugged formations by the fjords of many glacial streams. It is picturesque and beautiful in the extreme and affords rather thrilling variety of navigational problems.

The vessels of the Union Steamship Company fleet provide sailings every few hours from Vancouver, carrying passengers and supplies to logging camps, mining centers, salmon canneries, paper and pulp mills, and shipping centers for large agricultural districts. They serve, also, many beautiful summer resorts. This fleet has been a very large factor in the commercial life of the City of Vancouver.

Canadian Pacific Coastwise Fleet

Much publicity has recently been given to the palatial steamships of the Canadian Pacific Steamship Company operating in the transpacific and transatlantic services of that great corporation. In the glamor and notoriety surrounding these great leviathans the smaller but none the less important vessels of the coastwise fleet are liable to be forgotten.

The Canadian Pacific Railway Company owns and operates a very fine fleet of steamships in the British Columbia and Alaska coastal waters with headquarters at Vancouver. This fleet at the present time consists of 19 passenger carrying steamers, including two in course of construction for night service between Vancouver and Victoria.

In addition to the well known triangle route between Vancouver, Victoria, and Seattle, these steamers provide a double daily service between Vancouver and Victoria. There is a year-round service to Nanaimo from Vancouver, with four sailings each way daily during the summer and two sailings each way daily during the winter months. Sailings are maintained year round also between Vancouver and Skagway, Alaska, two sailings a week during the summer and at least every two weeks during the winter.

In addition to this Alaska service, there is a regular weekly service from Vancouver to Prince Rupert, which runs on clock-like schedule, leaving Vancouver 2 p.m. every Wednesday, arriving at Prince Rupert Friday afternoon; leaving at 10 p.m. the same day, arriving back at Vancouver 7 a.m. the following Monday.

The most picturesque and at the same time a very useful service is that for the west coast of Vancouver Island, with three sailings a month from Victoria throughout the year, augmented to two sailings

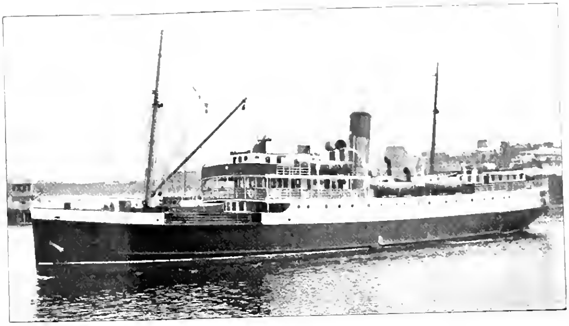
A GRAIN PORT

Here is one of the bulk grain elevators serving ships at Vancouver. In 1928 this "Pacific Gateway of Western Canada" shipped 97,000,000 bushels of grain, an increase of 124 per cent, as compared with 1927. This increase was in large part due to the splendid new facilities for grain shipping now provided by this port, which now has in shipside elevators a capacity of over 10,000,000 bushels and a shipping rate of 323,000 bushels an hour.

a week throughout the summer. On this west coast of Vancouver Island there is much rugged and grand scenery which is of great interest to tourists. The boats call at some forty odd ports, mills, and inlets, affording an excellent opportunity for the study of the peculiar formations of the coast as well as the industries of the region.

Another very interesting scenic route is the service to the numerous small and large islands of the Gulf of Georgia.

Altogether it would seem as if the British Columbia coast was very well serviced by the steamship operators, and, owing to the tremendous ruggedness of this coast and the tremendous expense and difficulty incident to the building of adequate railway and highway communication ashore, this condition of steamship operation will exist for many years to come.



Above, the Union Steamship Company of Vancouver steamer Cardena, leaving the Union dock, Vancouver, on her weekly yachting cruise to northen British Columbia ports.

At the left, the Union Steamship Company of New Zealand motorship Oarangi running into Vancouver harbor from the Antipodes. The Aorangi typifies the importance of Vancouver as a shipping center. Built for this run, she was, at the time of her building, the largest passenger motorship afloat.

Vancouver's Trade in 1928

The trade of the Port of Vancouver is showing a very healthy growth. During 1928, 21,806 vessels, aggregating a net tonnage of 11,644,000, entered the port, an increase of 7 per cent in number and 14 per cent in tonnage as compared with 1927. Of these totals, 1337 vessels, with a combined net tonnage of 4,695,000, were ocean-going, engaged in foreign or Canadian intercoastal trade.

The total foreign trade, including lumber, was 5,602,000 tons, an increase of 38 per cent over 1927. Of this, 4,300,000 was export, an increase of 58 per cent. Grain shipments — 97,394,934 bushels — increased by 124 per cent, largely due to the increased yield in Alberta and to the opening of the new 2,500,000-bushel Alberta Wheat Pool Elevator.

The storage capacity for wheat at Vancouver shipside elevators is now 10,400,000 bushels, and the shipping rate 323,000 bushels per hour.

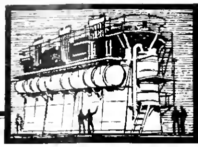
Over a million barrels of flour were shipped to China, 61 per cent more than in 1927.

The balance of Vancouver's huge export tonnage is made up of 1,344,568 cases canned salmon, distributed to every continent; 57,359 tons dry salt herring; 13,000 tons of pilchard meal; nearly four million gallons of pilchard oil; and over 200,000 tons of lead and zinc.

Vancouver is certainly doing her bit to feed the hungry workmen of the world's crowded areas.

It will be noted that the bulk of this export business is foodstuffs and raw materials. In the foodstuffs is a considerable quantity of manufactured food products, such as canned salmon and flour. More recently the attention of Vancouver has been directed toward the profits to be obtained in manufacturing some of their raw metals. An instance of this is the manufacture of storage batteries. The Coyle Battery Company of Vancouver has, during the past few years, built up a very substantial business, not only in its domestic market, but in the Fiji Islands, Australia and New Zealand.

The wooden bridge here shown crosses the Fraser River, just below Ladner. Its central spans are 160 feet long, and one of them is shown being floated into position on the bridge. This difficult piece of maneuvering and the building of the spans and of the piers was carried out by the Fraser River Pile Driving Company.



In the Engine Room

Mechanics for Marine Engineers

Part VII. A Beam Supported at Each End

By A. L. Becker.

IT is often necessary to support a beam D.C.B. when the span is too great for the beam to carry the load without intermediate stanchions. Often these stanchions are undesirable and in lieu of them the beam is supported by struts and a tie rod as indicated in the sketch.

To find the stresses in all parts of this support due to the loads indicated:

First take moments about the point 4 to find the reaction at the opposite end. D, C, and B being of equal length, use these lengths for the arm of the moment.

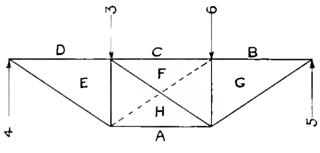
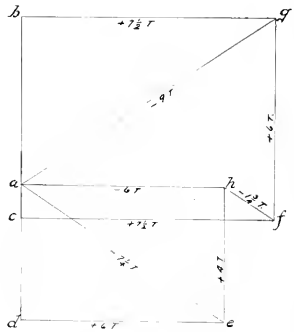


Fig 9.



The moment of 3 is 3 x 1 = + 3 R.H.
The moment of 6 is 6 x 2 = +12 R.H.
Total right hand moment +15

Left hand moment must be:
3 x 5 = —15 L.H.

5 is the right hand support, and the left hand support must be:
6+3=9—5=4

Starting with right hand support, draw a.b. equal to 5T in the direction the force acts. From b, draw b.g. toward g, so that a line from g parallel to G.A. will end at A. B.G. is plus, G.A. is minus, and their length on the stress diagram shows the stress in the members to the scale of a.b.

Consider the point under the load 6. Begin at g, trace g.b. to b.; from b draw b.c., a distance equal to 6 tons parallel to B.C.; and from c draw c.f. parallel to C.F., so that a line drawn from f parallel to F.G. will meet the point g. C.B. is + (as before) B.C. is +, C.F. is +, and F.G. is +; and the stress in each part may be measured from the stress diagram.

Consider the lower point under 6.

Trace A.G. in the stress diagram already found from a to g; from g trace g.f. already found from f; draw f.h. until a line from h parallel to H.A. will end on a. Observe the same conditions as above for sign and amount of stress, and mark these stresses on the sketch or stress diagram.

Consider point at 3.

Trace h to f, for H.F.; trace f to c for F.C.; from c draw c.d. parallel to C.D., a distance of 3 tons; from d, draw d.e. parallel to D.E., so that a line parallel to E.H. will strike the point of beginning h.

Consider the point below 3.

Trace h.e. already found to e; from e draw a line e.a. parallel to E.A. until a line from a parallel to A.H. will end on the point h. The value and signs of the stresses in the members considered can be determined in the usual way.

The diagonal H.F. is in tension as shown by reference to the stress diagram. If it were placed as the dotted line, it would be in compression. Also the stresses in the adjoining members would be slightly changed. If interested, the reader may correct the present stress diagram subject to this change.

Trade Literature

Brown Instrument Company has issued a very fine booklet entitled **"Power Plant Instrument Hand Book,"** which will be sent free on request to the company at Wayne & Roberts Avenue, Philadelphia, Pennsylvania. The booklet contains 47 pages and is beautifully printed and illustrated.

Instrument equipment is an individual problem in the power plant. The need of an adequate complement of instruments for the efficient operation of steam power plants is self-evident. The purpose of this book is to provide data from which a suitable plan of instrument equipment covering most operating needs may be easily worked out for any steam plant. The booklet lists 105 potential applications of instruments for the measuring of temperatures, pressures, machine speeds, and liquid levels related to steam power plant operation. The application of each instrument is defined, the purpose described, an illustration in which it is shown installed given, and a page reference provided for further data.

Kinks, Cautions, and Suggestions

Some Interesting Miscellaneous Material that will Provide Good Discussion for Engineering Personnel Afloat

By W. F. Schaphorst

Future Heat and Power

Nearly everyone is interested in the great question, "From what source will future generations derive their heat and power?"

Nobody knows the answer. One engineer in a well-written paper read before the American Society of Mechanical Engineers recently said that he considers the future a thing that we need not worry about. He believes that "science will find a way," but he does not know how science will do it.

But I am one of those who are inclined to view the situation with more or less alarm. The liquid fuel supply of the United States is already showing signs of exhaustion and may be depleted within a decade. I am in favor of conserving it and not wasting it as at present. I am in favor of restricting the rate of production. We should buy liquid fuel from foreign countries rather than entirely use up our own natural supply.

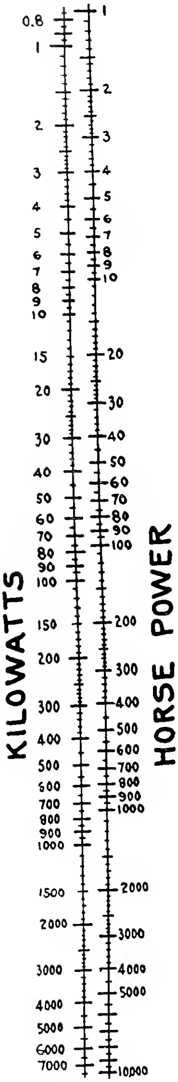
Claims have been made that sufficient oil can be extracted from shale to fill all demands for many years; but nobody has yet been able to extract the oil from the shale at a price that will begin to compete with oil from wells. I am informed that if our source of supply were dependent upon shale, and if we wanted to send our battle fleet across the Atlantic, it would require the mining, handling, and treating of nearly 1,500,000 tons of shale, or approximately the weight of the entire fleet.

Water power will not solve the problem. Steinmetz figured that out very carefully before he died. He proved that if the entire rainfall over the United States were utilized it would supply only a small fractional part of the needs of the population.

Tides will probably be utilized, but the harnessing of tides is very expensive. Besides, when it comes to furnishing heat, electricity cannot compare with good, old coal, wood or oil.

No worth while "sun engine" has as yet been developed. If some engineer could manage to place steam boilers on the sun and pipe the steam to the earth he would, according to one authority, obtain 12,500 horsepower per square foot. But sun heated boilers on this earth have been all but a fizzle; they cannot compete.

I am convinced that engineers of the future are going to have some decidedly knotty problems on their hands. We can assist them materially right now by conserving all heat producing products, especially coal and oil. We should do so.



Scale Removing Kink

A prominent manufacturer of evaporators taught me a useful kink a number of years ago for removing scale. The method is used in his evaporators and he informed me that it works very well. The kink might come in handy for others.

The evaporator is a reversible process design. Possibly some readers are familiar with it. It is so made that in a six effect apparatus, for example, either end may be the first effect and either end effect may be the sixth effect. Thus, steam is first admitted into one end at a given pressure and temperature and it comes out of the other end at a lower pressure and temperature. After several days of operation, depending upon the amount of scaling matter contained in the liquid or water, the process is reversed. Steam is admitted into the "other" end and the tubes which were formerly comparatively cool are now warmer. As a result the scale cannot form to a great depth. Scale is not entirely eliminated in this way; but when operated properly its thickness seldom if ever becomes greater than the thickness of an ordinary business or "calling card."

Similarly he informed me that this same method is applicable to condenser tubes. By alternately heating and cooling condenser tubes they will expand and contract, causing the scale to loosen and fall off. It is an inexpensive and effective method.

Kilowatt Horsepower Scale

Here is a scale that will be of interest to most engineers because it gives the kilowatts in any number of horsepower in a jiffy. Or, it will give the horsepower in any number of kilowatts. As will be noted, it is complete from 1 to 10,000 horsepower, within which range most power is included.

For example, how many horsepower in 1000 kilowatts? Just glance from the 1000 on the kilowatt side to the horsepower side, and there's the answer—1350 horsepower.

Or, how many kilowatts in 1000 horsepower? Glance across in the opposite direction and there's the answer again—750 kilowatts.

Of course the exact answer is 745.65 kilowatts, but for most ordinary and practical purposes 750 will do very well.

I doubt whether it would be possible to make a chart more compact than this and yet include such a wide range of power. A chart could be made more accurate, no doubt, but that would require much painstaking work and in the end this chart would very likely prove to be just as useful for ordinary work such as generally demanded.

Soot Cleaning Data

Below are some valuable figures that were collected by the Prime Movers Committee of the National Electric Light Association on the amount of steam used for soot cleaning.

Four classes of plants were surveyed: (1) those using natural gas; (2) small stoker-fired boilers; (3) large stoker-fired boilers; and (4) pulverized fuel fired boilers.

A gas flame is known to be very clean. Gas burns without cinders and practically without soot, hence the exceedingly small amount of steam required to keep gas-fired boilers clean.

Regarding the great difference in stoker-fired boilers, it is pointed out that the smaller ones are in older installations and consequently less efficient than the large modern plants. Also, the soot cleaning equipment on the smaller units is probably less effective.

The report shows that soot blowers on pulverized coal boilers are operated oftener than on stoker-fired boilers—two to three times as often. Of course more soot and ash are carried along with the gases in pulverized coal boilers.

Following is a tabulation of the percentage of total steam used for soot blowing:

Natural gas	0.0002
Stoker-fired (12,000 to 23,000 sq. ft.)	0.2
Stoker-fired (6,000 to 7,000 sq. ft.)	0.6
Pulverized coal	0.5

Boiler Corrosion

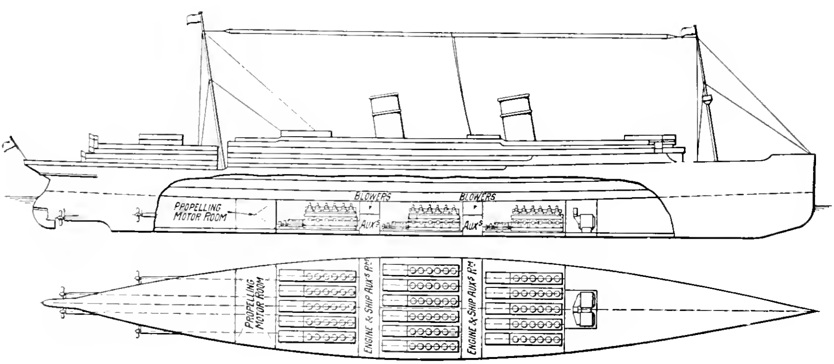
When boiler corrosion is below the water line it generally indicates that acid is contained in the water. When the corrosion is above the water line it usually indicates that the water contains considerable air.

A method recommended for preventing corrosion is this: Cover the surface of the boiler both above and below the water line with a thin lime coat. Soda ash in small quantities introduced in the feed water may also be helpful. Preferrably though, if corrosion is considerable, put your problems in the hands of unbiased consulting feed water specialists. Probably you need a deconcentrator, or a deaerator; possibly boiler compound will suffice, or a hot process softener, or the much used "salt system." There is only one best way in which to solve a given problem of corrosion, or a given problem of boiler scale.

100,000-Horsepower Diesel Plant

THE diagrammatic plan and profile of an Atlantic liner reproduced herewith show a proposed arrangement of diesel-electric units to produce 100,000 shaft horsepower. The suggestion of this type of power plant on this large scale comes from William Doxford & Sons of Sutherland and shows sixteen 6-cylinder, Doxford diesel generating sets, provided with scavenging and injection air by electric blowers and auxiliary diesel engine driven compressors, and providing electric power for four propulsion motors, each directly connected to a propeller. So far as we know, this proposal is the largest of the type yet suggested.

To the marine engineer it will be very interesting to note that in this arrangement the main generating units take the place exactly in the ship's hull which would be occupied by the boilers of a steam plant, and the cylinders correspond in number, approximately, to the oil burners of a modern marine steam plant. That, of course, is very natural, the cylinder of a diesel engine being the equivalent of an oil burner.



Marine Economizer Test

INTERESTING results have been obtained recently on the steamer Floridian in connection with the addition of a Foster economizer to her Scotch boiler plant. The Floridian is a Shipping Board vessel recently bought by the Strachan Shipping Company and reconditioned at the Tietjen & Lang Dry Dock Co., Hoboken, for the trade in citrus fruits between southeastern United States ports and western European ports. She is equipped with three Scotch boilers and a triple expansion engine, and fitted with refrigerating machinery.

The reconditioning of her power plant was for the purpose of producing sufficient steam for running the refrigerating machinery and at the same time keeping up full power on the main engines. As originally fitted it has been impossible to maintain more than 7½ knots average sea speed while running the refrigerating plant.

New oil burners were fitted to her boilers and a Foster economizer was installed at the base of the stack. With this equipment, stack temperature was reduced from 650 degrees to about 340 degrees. Feed water temperature was reduced to around 300 degrees and ample steam was provided for running all machinery wide open. As a result, the steamer has shown a speed increase of two knots and a decrease in fuel oil consumption of about 40 barrels a day. At this rate, the change in equipment will pay for itself in about six months running. This performance shows the possibility of reconditioning comparatively obsolete steamers to make very worth-while commercial vessels at a comparatively low outlay of capital and with no structural change in the hull.

Correspondence

Here is a rather interesting letter from British Columbia. It would seem more natural if the writer of this letter had a "Mac" in front of his name.

Dear Sir:

Re the article "Fuel and Safety; Oil versus coal in relation to safety of seagoing vessels," with particular reference to the ill-fated Vestris, by Arthur M. Tode:

After thirty years' experience in ship construction, both practical and theoretical, I differ on one or two points of the above article.

No discharge pipes go through the bunkers. They are carried under the floor or ceiling of bunkers, or through the bilge brackets, the bunkers being raised to allow convenient room for repairs to pipes.

The flooring plates in boiler room and bottom plates of side bunkers are usually iron, to withstand corrosion. Suction pipes in bilges and inner bottom have their ends encased in metal rose box, 9 to 12 inches square, all sides of box perforated with small holes, which must be twice the area of the suction pipe.

Boiler rooms are subdivided by water-tight bulkheads, and only side bunkers are not water-tight.

Bilge water is the water that accumulates in the tank side gutter and does not come from the inner bottom or ballast tanks.

The ballast tanks are not painted, but cement washed; and a layer of cement about 2 inches thick is given to the bottom of all ballast tanks whether they are used for water or oil fuel.

Ash shoots are normally on an angle from within the fiddley to within a foot or so of the water line. The ashes are hoisted up by steam gear into a hopper on the upper end. This hopper is usually of 1-inch thick plate with the shell at the lower end doubled on account of corrosion.

When ashes are injected through the inner bottom, the shoot can be used as a pump for water if boiler room is flooded.

Sanitary discharge pipes run into one large pipe discharging through one large valve; if below water, a screw double valve.

Coaling doors and cargo doors are fitted with rubber strips, when hoved up within with strong backs. The rubber cannot be washed out with the action of the sea. This also applies when spun yarn or putty is used.

Oil fuel from Borneo or Texas (flash point about 212 degrees) is noticeable as a dark oil stain when the doors are leaking and does no harm for it does not vaporize at ordinary temperature. Low flash oil like petrol needs all the attention that can be given, coming through when water will not.

The listing of the Vestris was no doubt due to some unexplained cause, and when the sea entered the various deck openings it was beyond the scope of the pumps to deal with it, whether she was carrying coal or oil for the boilers.

I am,

Yours truly,

Robert Andrews.

New Westminster, British Columbia.

The A. B. C.'s of Refrigeration

HAND BOOK OF REFRIGERATING ENGINEERING. By W. R. Woolrich, 330 pages, bound in imitation black leather with gold stampings; with supplementary tables and index. Published by D. Van Nostrand Company, Inc., 8 Warren Street, New York. Price $4.

This little book on a very timely subject is composed of material that was originally developed for a series of lectures for operating and constructing engineers desiring a complete course in refrigerating engineering and also for students, junior and senior rank, in American engineering colleges.

While applied specifically to refrigeration in industrial plants ashore, the bulk of the material covers in a very concise and complete way the fundamentals of refrigerating engineering, whether afloat or ashore, and it should therefore be of great interest as a handbook on this subject to all operating marine engineers. Vessels of any size at sea today are almost universally equipped with some refrigerating apparatus, and many of our larger passenger and freight liners are equipped with complete refrigerating systems of large capacity; so that it behooves the modern operating engineer to understand thoroughly the principles and practice of refrigerating engineering.

INSTALLATION NOTE

The Pacific Ice Machine Company of San Francisco has announced that two Brunswick-Kroeschell compressors for complete refrigeration equipment are being installed on the steamer Golden Cross of the Oceanic & Oriental Navigation Company.

Work is being done at the Oakland yard of The Moore Dry Dock Company.

Workboats and Their Power Plants

Pacific Workboat Notes

Anderson and Cristofani, Hunter's Point, San Francisco, are building an interesting twin screw cruiser for H. D. Hogrefe & Son. The principal characteristics of this craft are as follows: 60 feet length, 13 feet 9 inches beam, 4 feet 6 inches draft. She is intended for cruising outside on coastal work from Mexico to Alaska and is of unusually heavy construction, and the lines calculated to make a very seaworthy craft. Two **Hall-Scott,** marine type, gasoline engines will drive this hull at 16 miles an hour.

Siamese teak will be used for all of the exterior joiner work. This, combined with polished brass hardware and deck fittings, will give the cruiser a very pleasing appearance. She is to have accommodations for 10 persons and will be fitted with a shower bath with hot and cold running water, a large galley fitted with the combination coal and gas range, and with very comfortable sleeping accommodations for guests and crew.

Fuel tankage is provided to give the cruiser a radius of 1200 miles, and, as she will be equipped with considerable sail area, she will readily be able to negotiate long cruises in coastal waters.

Lee and Brinton of San Francisco and Seattle are the naval architects.

A typical pilot house on a modern cruiser.

Frank G. Bryant, California representative of the **Winton Engine Company,** advises that he has recently sold a number of new model Winton diesels to California yachtsmen.

Rex B. Clark of Los Angeles has purchased for installation in his palatial yacht Norconian, two Winton, Model 138, 200-horsepower, airless-injection, diesel engines; one Winton 15-kilowatt diesel engine generating set; one Winton, Model 139, motor-driven air compressor; and one Winton motor-driven fire and bilge pump. This yacht is leaving Los Angeles harbor about the middle of May for a trip to Detroit, Michigan.

A Winton, Model 144, 6-cylinder, 100-horsepower at 550 revolutions a minute diesel engine has been purchased by Stephens Brothers of Stockton for installation in a new 60-foot cruiser.

Pacific Coast Pleasure Boat and Sportsman's Exposition will be held in San Francisco from April 27 to May 4 and will be participated in by all the leading national manufacturers of pleasure boats, engines, equipment of all kinds, furnishings, and sportsmen's equipment. The exposition will be held in the Civic Auditorium, which affords almost unlimited space for the effective display of the products of exhibitors.

The Albina Marine Iron Works, Portland, Oregon, recently built a 250-horsepower Atlas-Imperial diesel powered tugboat for the Smith Transportation Company of Rainier.

The Island Tug and Barge Company, Victoria, British Columbia, has recently had its tug Edna Grace practically rebuilt and re-engined. Her name has been changed to Comet and she has been equipped with a 180-horsepower **Fairbanks-Morse** diesel engine capable of giving a speed of 10 knots. She has fuel oil storage capacity for 25 days supply and accommodations for a crew of 5. The boat is 65 feet long, 14 feet breadth, and 9½ feet draft. An unusual feature is the equipping of the boat with a radiophone,

The Kilkair, a new towboat of Vancouver, British Columbia, owned by McCoy-Wilson, Ltd. She was built by F. Matsumoto, is 65 feet long, 13 feet beam, and powered with a Sterling Petrel gas engine.

The Skansie Shipyard at Gig Harbor, Washington.

this being the third of the company's tugs to be so fitted.

Mojean & Erickson, boat builders of Tacoma, Washington, recently launched the cannery tender Salmo Point, designed by H. C. Hanson, Seattle naval architect, for the Shepard Point Packing Company of Seattle and Cordova for use in the shallow waters of Copper River flats, Alaska.

The vessel is 85 feet long, 21 feet beam, and 4 feet draft. She is powered with two 90-horsepower diesel engines. While having a hold, she is fitted with high bulwarks to permit the carrying of fish on deck.

A **Washington-Estep** diesel engine of 500 horsepower has been installed in the ex-government hull purchased by the R. J. Ultican Tug Company of Grays Harbor, Washington. The tug, when ready for service, will be used in ocean-hauling of log rafts.

Al Larson, San Pedro, boat builder, has recently completed the Flamingo, an 80-foot purse seiner, for Nick Dragich. The boat is powered with a 200-horsepower **Atlas-Imperial** diesel engine, giving her a speed of 10.12 knots on trial run.

This yard now has two 74-foot purse seiners on the building ways.

Halibut boat Melville, built for Captain J. Iverson by Prince Rupert Drydock & Shipyard and powered with 75-horsepower 3-cylinder Fairbanks-Morse diesel engine.

The C. & G. Cooper Company of Mt. Vernon, Ohio, announced the removal of its Los Angeles branch office to 630 East 61st Street, combining at this location with a new warehouse previously acquired. The new location is near Avelon Boulevard in the Goodyear industrial tract and more centrally located for serving the company's patrons.

NEW ATLAS POWERED TUG AT PORTLAND

ALL ready for the installation of the main power plant, which will consist of a 250-horsepower Atlas-Imperial diesel engine, a new steel tug the Wilavis for the Smith Transportation Company, was floated by the Albina Marine Iron Works. Instead of the new vessel sliding down the ways she was lowered overboard by means of the big Union Pacific crane.

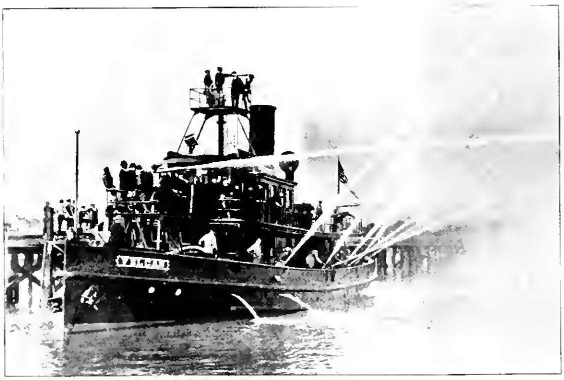
In appearance the Wilavis is a finished product, even to the stack, as all possible parts of the work were carried out in advance of the craft being floated. The steel deck house covering the engine room was left so it can be lifted off to permit the engine being lowered into position, after which the house will be replaced and riveted.

The Wilavis, designed for river towing, has a length of 65 feet, beam of 16 feet, and depth of hold of 8 feet. Other than such parts as the wood deck in the living quarters and the two jack staffs, steel predominates in her construction. In the hull lay-out three watertight bulkheads were provided, and on each side of the engine room are located the oil tanks. An automatic electric set is included in the auxilliary equipment and the electric wiring is waterproof. An unusually heavy and rigid engine bed is in place. This is the first steel tug built in this district for operation with a diesel engine.

A British Columbia automobile ferryboat, powered with a 120-horsepower 4-cylinder Fairbanks-Morse diesel.

A typical British Columbia fishing boat and cannery tender, 52 feet long by 14 feet beam, driven at 10 knots by a 60-horsepower C.O. engine. Built by Chappell Brothers.

Three Types of Sterling Fire-Fighting Craft



The sturdy dependableness and comparatively light weight of the modern gasoline engine combine to make this unit an ideal prime mover for fireboats. We show here three types of this craft equipped with Sterling engines.

Above is the latest addition to the fire-fighting fleet of Los Angeles Harbor, a light weight, high speed launch.

In the center is the Vulcan, a seagoing tug converted into a gasoline fireboat for the protection of the harbor of Norfolk, Virginia.

Below is the J. H. Carlisle, especially designed for fire-fighting work at the harbor of Vancouver.

An Interesting Shallow Draft Towboat

A NEW river towboat, the Katherine D, was recently completed by the Nashville Bridge Company, Nashville, Tennessee. She is of all steel construction, with an over-all length of 91 feet, and over-all beam of 19 feet, a depth amidships of 4 feet 2 inches, and a loaded draft of 3 feet.

The power plant consists of a 6-cylinder, 150-horsepower, Fairbanks-Morse diesel engine operating at 400 revolutions per minute. This engine drives the stern wheel through a line shaft silent chain to a jack shaft and Link-Belt roller chain to the stern wheel shaft. The line shaft is equipped with S.K.F. self-aligning ball bearings. The mitre gear unit which drives the silent chain is equipped with self-aligning roller type bearings, and the jack shaft and stern wheel shaft are mounted in roller bearings. It is found in river towboat service that these anti-friction bearings require practically no attention and are much more economical of upkeep and lubrication than the ordinary sleeve type.

The Fairbanks-Morse engine on this boat is equipped with an electrical pyrometer apparatus for indicating the exhaust diameter of each cylinder and with an electrical tachometer with the recording dial located in the pilot house. Mechanical remote control of the engine is installed and Johnson Fries pneumatic steering gear. The navigator in the pilot house therefore has complete control of the vessel at all times, being able to start and reverse his engine and vary its speed as desired and having on an indicator board the exact revolutions of the engine and the exact degree of rudder angle.

The Influence of Rudder Shape on Steering Ability

THE most recent of the publications in engineering of the University of California is a brochure by Professor Charles F. Gross describing some interesting experiments on the influence of rudder shapes on steering. The experiments were made with an improvised tank and with carefully molded models of ferryboats. These models covered the hulls of 13 existing vessels; three of the models were of hulls of vessels having side paddles and five of those having screw propellers. An analysis is made of the shape and area of the rudders of five other types of ferryboats representing 19 more vessels. So that the study covers the rudders of 32 ferryboats now operating on inland waters of the United States.

The tank used was a flume in the hydraulic laboratory wherein a constant stream of water was kept moving. The model was held in this stream by an arrangement which allowed it to go in vertical or rolling motion. The movement of the model from the center line of the channel was counteracted by attaching a silk thread at the center line of the deck to the after end, this line being laid over small pulleys at either side and ending in a hook by which one gram weights might be applied. The tendency of the rudder to swing the hull was measured in grams by holding the model in the center of the stream through the application of weights on these hooks.

Three rudders were made for each model, all three being of equivalent areas but very different shapes. The results indicated that there was a greater tendency for the model to change its course when steered by a rudder whose area is low in the water.

The investigation of the ratio of the area of the rudder to the lateral plane of the hull shows that this ratio is determined in a very arbitrary fashion. It varies over the 13 types of hull investigated from 93 per cent to 3.45 per cent. It is suggested that specifications in this regard should be more definite and should require that the rudder be of such area and of such shape that under specified speed and load conditions it could alter the course of a hull in a specified manner.

Tuna Boat Hermosa Makes a Record

By O. H. Barnhill

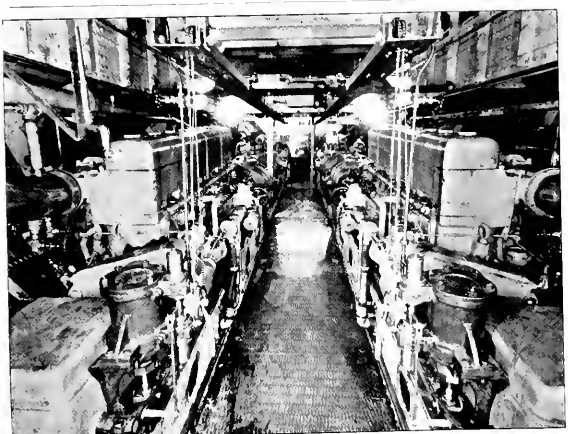
THE old passenger steamer Hermosa, recently converted by William Maggio of San Pedro into a tuna fish boat, is making an enviable record in southern California and Mexican waters. During the last weeks of 1928 she made three long fishing trips, which totalled about 10,000 miles, without any adjustment of her main or auxiliary engine. The latter, a 45-horsepower Fairbanks-Morse diesel, made one 600-hour run and another of 800 hours without stopping. This made it possible to keep sea water constantly circulating in the bank tanks. As a result, the fish not only were kept alive, but some of them were brought back to port considerably increased in size.

Loaded with 75 tons of crushed ice for packing fresh fish and seven tons of sardines in 120 tons of sea water for bait, the Hermosa makes 11.7 knots per hour, leaving behind many other vessels of the tuna fleet. With her Fairbanks-Morse diesel engine turning at 235 revolutions per minute and delivering 520 horsepower to the propeller shaft, she burns 25 gallons per hour of 27-degree Union fuel oil which costs 2.7 cents per gallon, and uses five gallons of lubricating oil each 24 hours. This makes a total cost for fuel and oil of 80 cents an hour, or only six cents a mile.

The Hermosa is 150 feet long, 26-feet beam, and 11 feet depth. She has cargo space for 225 tons of iced fish and is the largest tuna boat afloat. On her maiden voyage she brought in 130 tons of yellowfin, worth about $100 per ton. Her second trip netted 100 tons. On her last cruise she went 200 miles beyond Socorro Island, which is 400 miles southwest of the tip of Lower California peninsula, but found few "chickens of the sea."

The Hermosa's auxiliaries are all driven by electricity, an improved feature to which Fairbanks-Morse representatives credit much of her success.

Editorial Note. Since the above was written, the Hermosa has lost her position as the largest tuna boat on the Pacific Coast. The Glenn Mayne has come out from the East Coast to fish out of San Diego, and this vessel, formerly the deepsea tug Endeavor, is 160 feet long, 31 feet beam, and 12 feet loaded draft, with capacity of 350 tons of iced fish and 160 tons of live bait and water.



Interior of the engine and pump room of a modern fire-fighting craft equipped with Sterling gasoline engines and completely controlled from the pilot house.

Auxiliaries—Ship Supplies—Marine Equipment

Todd Installation for Pulverized Coal

Shipping Board Merchant Fleet Corporation Converts Steamship West Alsek to Pulverized Fuel Burning

AS a further step in the adaptation of pulverized coal burning to sea-going vessels, a contract has been entered into with the Todd Shipyards Corporation of New York by the United States Shipping Board Merchant Fleet Corporation to convert the steamship West Alsek from a hand-fired, coal-burning vessel to a pulverized coal burning vessel.

The Steamship West Alsek is a steel cargo vessel of 8529 deadweight tons built in 1918. This vessel is 410 feet 5½ inches long, 54 feet breadth, and 29 feet 9 inches depth. She is fitted with one triple expansion engine of 2750 indicated horsepower. Steam is furnished by three single-ended, hand-fired, Scotch marine boilers. This vessel is representative of the type which makes up the bulk of the cargo carriers in the fleets of the world. This type of vessel is finding it increasingly difficult to compete with the more modern types such as ships equipped with oil-burning steam installations or with diesel engines because of the lower economy of its power plant and the fact that the fireroom task in a hand-fired coal vessel is becoming less suitable to the standards of American labor.

The Fuel Conservation Committee of the United States Shipping Board Merchant Fleet Corporation, consisting of representatives of the various engineering societies and headed by Captain C. A. McAllister and Captain R. D. Gatewood, has, since its formation in 1922, directed its efforts toward improving the fuel enonomy of American merchant vessels. As a step in the carrying out of the committee's program, about two years ago, tests were instituted at the Fuel Oil Testing Plant, United States Navy Yard, Philadelphia, to determine if it were practicable to burn pulverized coal in seagoing merchant vessels.

The Shipping Board freighter West Alsek, which is now at the Todd plant in Brooklyn being converted for the burning of pulverized coal.

The Todd Shipyards Corporation developed, at its plant in Brooklyn, a combined unit type burner and pulverizer. This apparatus was submitted to the Fuel Conservation Committee and as a result extensive tests were conducted on the marine boiler at the navy's Testing Plant at Philadelphia. During these tests, this apparatus was subjected to various conditions expected to be encountered in actual seagoing service. A final series of test runs showed merit of such a high standard that the Merchant Fleet Corporation considered it advisable to extend the tests to an actual seagoing installation such as is now being made on the West Alsek.

This vessel is now at the Todd plant in Brooklyn undergoing the usual voyage repairs, and the work of necessary modifications to the vessel and the installation of the pulverized coal equipment are to be carried forward immediately with the expectation of having the vessel in service the latter part of May.

The Todd system differs from other pulverized coal burning systems in that it employs individual pulverizing units for each furnace of the marine boiler. The pulverizers are located close to the furnace fronts, and the coal, which has been pulverized to a degree of fineness that permits it to pass through a 300-mesh screen, is delivered to the burners by air from the primary air blower. The Todd apparatus is of such convenient size that it may be installed in any space usually devoted to the firing of boilers aboard ship. It is thus available for use on small steamers.

Another outstanding advantage is that the independent units are so arranged that any one of them may be shut off while replacements or repairs are being made, without cutting out the whole boiler, as the other pulverizers will continue to function. It is also possible to substitute oil for coal in this type of burner.

In the tests of the Todd pulverized coal burner, it was found that coal containing up to 10 per cent of

moisture could be used effectively. The coal used was bituminous screenings costing about $4 a ton f.o.b. Hampton Roads and about $4.50 a ton f.o.b. New York.

If ordinary bunker coal is used it will be carried by conveyors from the bunkers to a crusher and then conveyed to the individual pulverizers for grinding to the necessary fineness. The tests showed that with the Todd system combustion is so nearly complete that there is practically no ash and no trace of soot is to be found in the fireroom.

Difficulties of distribution of the pulverized coal to the various furnaces have been eliminated in the Todd system, and since the completion of the navy yard tests orders have been received for the installation of the Todd equipment in several types of vessels. In addition scores of inquiries regarding details of the system and costs of installation have come to the corporation from shipowners, not only in the United States and Canada, but in England, Germany, France, Italy, South America, Japan, and the Scandinavian countries.

Ellis Barges for United Fruit Company

FIVE HOLD barges, the first to be designed on the Ellis Channel System of Steel Hull Construction, have been ordered by the United Fruit Company for use in the neighborhood of Panama. These barges are also the first on the Ellis system to be designed with shaped ends and the first to be equipped with rudders for greater ease in towing. They are 85 feet long, 24 feet wide, and 7 feet deep. The hatches are 18 feet wide and 64 feet long, covering the entire hold. One barge is equipped with six oil tanks, 30 feet long and 6 feet diameter. Cargo capacity in all cases is 200 tons, and there is a water-tight bulkhead at each end of the cargo space. Steel is being fabricated by the United States Steel Products Company at Baltimore. Erection is in progress at Balboa, Canal Zone. The first barge will be put in service about April 1.

An Ellis barge for fruit carrying in the pineapple industry of Hawaii also is under construction at the Wallace Yard, Seattle, for Young Bros., Ltd., of Honolulu. This barge is 130 feet long, 40 feet wide, and 10 feet deep. It will have 725 tons deadweight capacity. A tug boat now under construction at Seattle for the same owner will tow the barge to Honolulu.

The many recent orders from leading marine owners for barges received by the Ellis Channel System indicate the growing popularity of steel channel construction. Satisfactory performance of barges originally bought has resulted in frequent repeat contracts from such companies as Merritt, Chapman & Scott, Ltd., Raymond Concrete Pile Company, Anaconda Copper Company, and others.

Seen in New York Harbor for the first time a little over three years ago and adapted to use in South America almost immediately, the channel system was soon taken up on the Great Lakes and on the Pacific Coast. The rugged strength and low up-keep of Ellis hulls, combined with ease and rapidity of construction, especially outside of the country where the element of portability is important, has developed a demand reaching into the West Indies and the Canal Zone, to the Hawaiian Islands, and across the Pacific to eastern Asia.

The extremely varied service for which Ellis hulls have been built also indicates the wide adaptability of the channel system. Harbor lighters for railroads, wrecking barges, pile driver barges, cable barges for telephone service, and other kinds of deck barges have made up the initial demand.

This view of the erection of an Ellis channel-system barge for the Raymond Concrete Pile Company was taken in Venezuela on the fourth day of work.

SAFETY SHOES

IN analyzing the causes of accidents along the San Francisco waterfront, the Safety Engineer of the Pacific American Steamship Association, the Shipowners' Association of the Pacific Coast, and the Waterfront Employers' Union discovered that a large proportion of the accidents reported were to the toes and feet of sailors and stevedores.

After a thorough investigation into this matter and into various types of shoes, the Safety Committee of the associations adopted a "safety shoe," which is manufactured in San Francisco.

This shoe has a special safety toe made of a composition of felt, tar and cement, and it is guaranteed to remain rigid under any ordinary working condition. The toe will resist the pressure of 400 pounds.

The Safety Committee arranged to have these shoes sold to the employees of the steamship and stevedoring companies at wholesale prices through the timekeepers on the docks. For those desiring to have the shoes fitted, arrangements were made with a store keeper on the Embarcadero to carry the shoes.

This matter of safety shoes is only one of a large number of details that enter in the shipowners' safety program. In view of the fact that approximately one-sixth of all of the accidents in 1928 were to toes and feet, it is one of the important factors in safety and it is hoped that the wearing of these shoes by a large proportion of stevedores and seamen will make a very decided reduction in the number of accidents.

Kohler Electric Plants in The Marine Industry

KOHLER electric plants are used for emergency and auxiliary lighting on large boats, as well as the sole source of current on the smaller boats. They deliver 110-volt current at the press of a button anywhere in the circuit.

The Byrd Expedition selected five Kohler electric plants for their trip to the South Pole. The expedition will be wholly dependent upon these plants for operating three powerful radio receiving and transmitting sets and for lighting the living quarters, machine shops, and store house.

The bark City of New York and the supply ship Eleanor Bolling are also supplied with electricity furnished by Kohler electric plants.

Radio Operator Berkner on the bark City of New York, in the South Pacific, bound for New Zealand, base of supplies, flashed the first news of the Kohler electric plants with the Byrd Expedition. A very satisfactory report—"5 kilowatt engine generator working exceptionally well—fuel consumption below that anticipated."

The fact that five plants were chosen by Commander Byrd for the expedition is a significant indication that these plants must possess a noteworthy degree of dependableness. This is an important factor in the selection of electrical equipment for emergency or auxiliary use. Kohler electric plants are built to withstand rough usage. They embody features in design and operation which make them particularly adaptable for use in the marine industry. They supply 110-volt current at the press of a button anywhere in the circuit. The Kohler plant starts automatically. When used as an emergency source of supply it will cut in and supply current for light and power without human intervention.

The Navy Department of the United States Government has recently purchased 110 Kohler electric plants for emergency operation of the radio sets on board destroyers and mine laying boats. Kohler electric plants have been in use on the government air mail routes for a number of years, supplying current for beacon lights.

Model "EP-36," a new addition to the Kohler electric plant line, is particularly adaptable for installation on board boats having 32-volt storage batteries. This plant has a charging rate up to 42 amperes and operates very efficiently.

Kohler electric plants are built in several sizes—1½, 2, 5, and 10 kilowatts. They are available for supplying 32, 110, or 220-volt direct current. A 5-kilovolt-ampere automatic plant in either 110 or 220 volt, 60-cycle, 3-phase, alternating current is the newest addition to the line.

Kohler electric plants for marine use will be shown at the Pacific Motor Boat Show to be held in the San Francisco Civic Auditorium on April 27 to May 4.

Book Reviews

THE CRUISE OF THE NORTHERN LIGHT. By Mrs. John Borden. Bound in blue buckram, with many illustrations. Published by The MacMillan Company, 350 Mission Street, San Francisco. Price $4.50.

This volume should be especially interesting to the marine fraternity of the Pacific Coast as it is a circumstantial account of the polar voyage of the yacht Northern Light, built especially for the purpose at the yard of W. F. Stone & Son of Oakland. Mrs. Borden, Chicago society and sports woman, accompanied her husband on this expedition in search of museum specimens.

The book is profusely illustrated from photographs taken on the voyage. Wild adventures with the ice pack and with big game of the Arctic Circle are recorded in vigorous fashion.

Sea scouts, especially picked for this work, formed the bulk of the crew of the Northern Light, and those interested in the psychological study of the impact of wild nature on the minds of several society women and a group of naive young seamen will find the text of this book very refreshing and interesting reading.

MAKING OF A SAILOR. By Frederick Pease Harlow. Publication No. 17 of the Marine Research Society, Salem, Massachusetts. Price $5.

Notice of this book appeared in the January issue of Pacific Marine Review. The author as a boy shipped on the Yankee square rigger Akbar from Lewis Wharf, Boston, in the Seventies of the last century for a voyage which carried this windjammer and her crew into various out of the way ports and finally around the world. The book abounds in picturesque descriptions of life in the forecastle, describes the daily round of duty around the decks, and the relations, cordial and otherwise, existing between the officers and crew.

An unusual feature of the book is the inclusion of many old American ship chanties with their music. A number of very fine illustrations of old photographs add to the interest of the work.

SEA SLANG. By Frank C. Bowen. 134 pages and numerous illustrations. Published by Sampson Low, Marston & Co., Ltd., London. Price 3/6.

This handy size little book in blue buckram, with white stampings, is a "dictionary of the old timers' expressions and epithets." It is charmingly illustrated with a number of full page sketches by Seville Lumley and frontispiece by Kenneth Shoesmith.

Frank C. Bowen, the author, is well known as a historian of ship progress. In the early days of the world war, he enlisted as a seaman in the British Navy and became interested immediately in the slang phrases then being used by the old hands, many of which phrases apparently dated back to days long before Nelson. Going down to the British Mediterranean Fleet in 1927, he found that the use of these old phrases had practically disappeared. The idea immediately suggested itself that they should be picked up and recorded in book form. The present volume is the result. The author neostyled three or four hundred phrases and sent them to sailor friends all over the globe, asking for their help in defining these terms. He therefore gives credit for the book to "all parts and all ranks at sea from naval cadets to admirals, from liner captains to North Sea fishermen." Specifically and specially he thanks F. C. Matthews of San Francisco, David Marvin of New London, Conn., and Frank W. Wallace of Gardendale, Quebec.

Westinghouse Creates Diesel Department

EFFECTIVE February 1, a marine and diesel engine section of the sales department was created at the South Philadelphia Works of the Westinghouse Electric & Manufacturing Company, with Carl J. Lamb as section manager. This section will handle all marine and diesel engine negotiations and other matters pertaining to the sale of this apparatus.

Mr. Lamb has had considerable experience in the marine and diesel field. He was educated at the United States Naval Academy and served during the World War as an engineer officer aboard the U.S.S. Henderson. He is a lieutenant in the United States Naval Reserve. Before becoming associated with the Westinghouse company, Mr. Lamb had spent considerable time as an engineer officer on both steam and diesel engine vessels and holds an unlimited tonnage chief engineer license for both steam and diesel engine vessels.

Carl J. Lamb.

He is a member of the Society of Naval Architects and Marine Engineers, American Society of Naval Engineers, U.S. Naval Institute, National Security League, U.S. Naval Reserve Officer's Association, the Military Order of Foreign Wars, and the U.S. Naval Academy Alumni Association of Philadelphia.

Trade Notes and Personals

As of January 1, 1929, **The Prest-O-Lite Company, Inc.**, acquired the business of the Acetylene Products Company, which operated two acetylene producing plants located respectively at 401 E. Buchanan Street, Phoenix, Arizona, and at 914 Texas Street, El Paso, Texas.

These plants are now being operated as units of the Prest-O-Lite chain. Including these additions, the Prest-O-Lite plants now number 38, located at industrial centers throughout the country to supply the local demand for dissolved acetylene used in welding and cutting.

Everett R. Kirkland is superintendent of the Phoenix plant and Carl F. Chesak is superintendent of the El Paso plant. R. G. Daggett, whose headquarters are at the San Francisco office, is district superintendent.

The thirty-ninth acetylene gas plant of the **Prest-O-Lite** chain, located at 925 Hughes Street, Houston, Texas, started operations February 2, 1929, and will supply dissolved acetylene for welding and cutting to local industry. A. J. Harrower is superintendent of the new plant and H. F. Sautter, whose headquarters are at the Dallas Prest-O-Lite plant, is district superintendent.

Ingersoll-Rand Diesels for Use Abroad. The Thames Steam Tug and Lighterage Company, Ltd., has purchased a Carels Ingersoll-Rand, 6-cylinder 14 by 19 solid-injection diesel engine for installation in its new tug being built by the John I. Thornycroft and Company, Ltd., Southampton, England.

Weaver L. Marston

The engine is of the direct-reversible type. It is similar in size and construction to the Ingersoll-Rand engines that are being used, with marked success, for this class of service in America.

The Lincoln Electric Company, Cleveland, Ohio, manufacturer of Stable-Arc welders and Line-Weld motors, announces the appointment of C. M. Taylor as sales manager.

Mr. Taylor graduated from Western Reserve University in 1916 and immediately entered the employ of The Lincoln Electric Company, and shortly thereafter was made foreman of the assembly and test departments. In 1917 he enlisted in the United States Army for the duration of the war and spent two years in the United States Army Air Corps as an aviator.

Upon his return to The Lincoln Electric Company after the war, Mr. Taylor was made time study demonstrator and observer. In 1923 he was promoted to factory manager and in 1925 was elected as vice-president of the company. Mr. Taylor remained as factory manager until his present appointment as sales manager.

The Brown Instrument Company of Philadelphia has announced that the rapid growth of industry on the Pacific Coast and the increasing demand for modern industrial and power plant instruments has made it necessary for the company to enlarge its Los Angeles factory branch. The new office will be in the fourth floor of the Westinghouse building, 420 South San Pedro Street.

Weaver L. Marston has been appointed general manager for the Pacific Coast by the Sharples Specialty Company, manufacturer of the Sharples super centrifuge used for oil purification. Mr. Marston, who takes the place of the late Lawrence A. Taylor, was formerly assistant sales manager at the company's main office at Philadelphia.

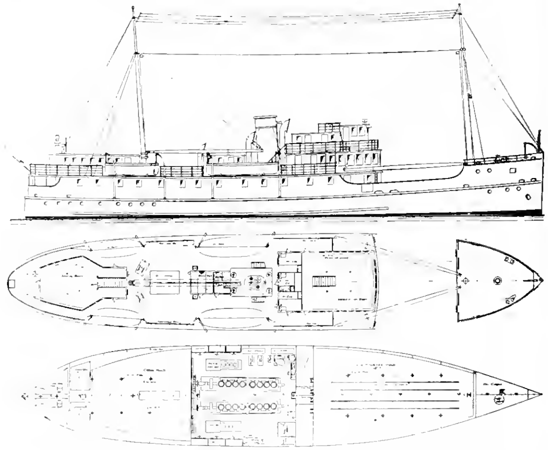
The Sharples Specialty Co. has offices at 686 Howard Street, San Francisco, where Mr. Marston will make his headquarters, and at 406 San Fernando Building, Los Angeles, in charge of J. H. Wilcox.

New Motorship for Alaska Service

THE Lake Washington Shipyards of Houghton, Washington, are now building for the Northland Transportation Company of Seattle a passenger and refrigerated cargo motorship to be used on the Seattle-Ketchikan run. This vessel, to be named the W. B. Foshay, was designed by Lee and Brinton, naval architects of Seattle and San Francisco. She is of steel construction throughout, her principal characteristics being:

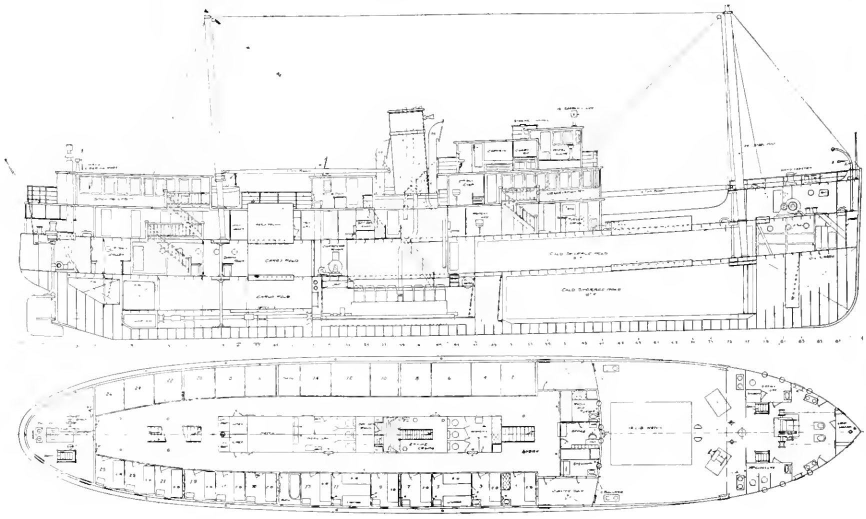
Length	186′0″
Beam	35′0″
Depth	21′6″
Power on twin screws, S.H.P.	1120
Speed, knots	12
Passenger capacity	54
Freight capacity, cu. ft.	37,000

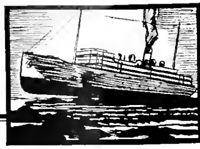
For motive power, she will have two 560-shaft horsepower, 8-cylinder Washington-Estep airless injection, directly reversible, marine type, diesel engines, each directly connected a propeller shaft. Two 4-cylinder, 88-horsepower diesel engines, directly connected to 50-kilowatt generators, supply light and auxiliary power. As will be noted from the drawings reproduced herewith, the great majority of the cargo space is refrigerated. All of this space is carefully insulated with cork and equipped especially for the transportation of perishable cargoes.



Allan Cunningham of Seattle is to supply the electric windlass, four electric cargo winches, and the electric steering gear.

The lines, profile, and arrangement of the W. B. Foshay indicate an economical, seaworthy, and trim craft for coastwise purposes. Her operation on this route will be watched with interest and it is hoped that she will be the forerunner of a large fleet of this useful and handy type of motor vessel.





Marine Insurance

Edited by JAMES A. QUINBY

When is a Warehouse?

Appellate Court Affirms Insurers' Liability Under Well Known Clause

READERS of this column will recall that we had occasion in our issue for August 1928 to report the District Court decision of Judge Kerrigan in the case of Lindo vs. Ocean Marine Insurance Company, 1928 A.M.C. 1335, holding a marine insurer liable under the warehouse to warehouse clause, for goods consumed by fire in a custom house at destination. The insurer appealed to the Circuit Court of Appeals for the Ninth Circuit, sitting at San Francisco, which recently affirmed the decision of the lower tribunal.

As the case forms an important addition to the meager fund of law upon a subject of great importance to both shippers and underwriters, we set forth below extracts of the appellate court's opinion.

The Steam Schooner

The tub that I sing is an unlovely thing,
With her stern where her 'midships should be.
She fingers her nose at the sky as she goes
With her quarter all smothered a'lee.
She's peculiar designed, for her house is behind,
Like a fat woman sitting well aft,
But she navigates mud as no other rig could,
This sturdy amphibian craft.
Let those who lampoon her laugh at the steam schooner
With deckload as high as her stack,
But seamen who love her will tell you this of her:
She most always gets there and back.

J. A. Q.

The Facts

"In March, 1924, Schlubach, Sapper & Company, who were engaged in business in Guatemala City, Guatemala, purchased of Palazio & Company at Corinto, Nicaragua, a quantity of cotton for the purpose of filling an order previously received by them from Ibarguen Hermanos, owners of a mill in the interior of Guatemala. This cotton was to be carried by steamer from Corinto to San Jose, the port of entry for Guatemala, and after passing the customs to be there delivered to Schlubach, Sapper & Company to cars, for final shipment by rail to Ibarguen Hermanos. Prior to these shipments, the appellant had issued to Palazio & Company an open marine policy of insurance covering loss and damage by fire to goods shipped by them from Corinto to various ports, including Guatemala, and Palazio & Company had authority to issue certificates under such policy covering shipments made on their own account as principal, or as agents for others, or for account of others when ordered to insure. This policy was in force at the time of the shipments, and at the request of Schlubach, Sapper & Company, Palazio issued certificates thereunder covering the shipments in question, loss if any payable to them.

The Eupatoria arrived at San Jose on April 4, discharged her mail and passengers but, being unable to discharge cargo on account of the congested condition of the port, proceeded to Champerico, a distance of about seventy miles, returning to San Jose on April 11, when forty-five bales of cotton were discharged and placed in the custom house bodega (warehouse). The San Juan arrived at San Jose on April 10, and ninety-five bales were discharged and placed in the custom house bodega. On the 16th of April and before the customs regulations had been complied with and the cotton removed by the consignee for reshipment to its ultimate destination, the custom house buildings were burned, and 129 bales of cotton were destroyed by fire. Due proof of loss was made and payment refused, hence this suit.

The Insurance Coverage

Finally it is the position of the appellant that the insurance risk terminated when the cotton was deposited in the custom house at San Jose. This requires a construction and application to the facts of a clause of the policy which reads: 'The insured goods are covered, subject to the terms of this policy, from the time of leaving the shipper's or manufacturer's warehouse during the ordinary course of transit until on board the vessel, during transshipment if any, and from the vessel whilst on quays, wharves, or in sheds during the ordinary course of transit until safely deposited in the consignee's or other warehouse at the destination named in the policy; but in any event risk hereunder to cease within ten days after landing at destination.' This clause in marine insurance policies seems to be of comparative recent origin and there is apparently but little authority as to its application under circumstances similar to those in the instant case. The only cases to which our attention has been called at all analogous are those of Martin vs. Nippon Seas, 3 Commercial Cases 164, and Ganiere vs. Eastern Company, 7 Lloyd List Law Reports, 188. In the Martin case, the policy covered the goods until safely delivered to the consignee. The goods were entered at the custom house, after which they were held by the customs authorities in the name of the consignees and to their order, subject to the payment of duties, storage, and other charges.

The goods while in the custom house were totally destroyed by fire. The court found as a fact that for the purpose of the custody of the goods the warehouse of the customs was the warehouse of the consignee and therefore delivery to such warehouse was a delivery to the consignee. In the Ganiere case, the goods covered by a policy containing a 'from warehouse to warehouse' clause were received at the Petrograd custom house and ultimately taken by persons purporting to act on behalf of the Russian Government, and the court held as a fact that the custom house was not holding as the agent of the consignee and consequently the insurance had not terminated or run out. It would seem therefore that whether goods covered by a marine policy containing a 'from warehouse to warehouse' clause have, in a given case, been safely deposited in the consignee's or other warehouse at destination is a question of fact from the circumstances of each particular case.

Now the evidence shows that all goods going to Guatemala whether dutiable or not must pass through the custom house at San Jose, comply with the customs regulations, and pay certain fees. Until these requirements are complied with the consignee is not entitled to the possession of the goods. There was no unreasonable delay on the part of the consignee in the instant case. As a consequence it cannot be said, we think, that the goods were safely deposited in the consignee's or other warehouse within the meaning of the policy, while in the custom house, regardless of the nature or character of the building or structure used by the government for the storage of goods while passing customs. The warehouse to warehouse clause was evidently intended to cover the goods after being discharged at port of destination while in the ordinary course of transit to the consignee's warehouse or some other equivalent place of storage where the goods were held for the consignee. The risk continued after the goods were landed and during the period reasonably required for this purpose not exceeding ten days.

We are unable therefore to agree that taking the goods to the custom house for the purpose of clearance accomplished the safe deposit thereof in consignee's or other warehouse referred to in the policy in the absence of some voluntary act of neglect of the consignee's indicating an intention to adopt the custom house as a place of storage of their goods.

Decree affirmed."

Attorneys involved in the case were W. S. Andrews and Bell and Simmons for the appellant, and Derby, Sharp, Quinby and Tweedt for the appellee.

Supreme Court Affirms Stockholder's Right to Limitation

IN our issue of June 1928, we had occasion to discuss the decision of the Circuit Court of Appeals for the Ninth Circuit in the case of Flink vs. Paladini, et al, 1928 A.M.C. 873, which was an appeal from the order of the District Court vacating a restraining order formerly issued in connection with a petition to limit liability. Flink, a seaman, was injured on one of Paladini's boats, and sued the vessel owners and the stockholders in the owning corporation. The District Court's order assumed that the stockholders were not entitled to limit their liability since the Liability Act refers specifically to "owners."

The Circuit Court of Appeals reversed the ruling of the District Court and held that the benefit of the Limitation Act is available to stockholders in a shipowning corporation. The Supreme Court of the United States, on March 5, affirmed the decisions of the Circuit Court of Appeals, thus preserving to corporate vessel owners the benefit of the limitation statute.

The Supreme Court opinion, delivered by Justice Holmes, reads in part as follows:

"The Circuit Court of Appeals disposed of the case after a thorough discussion. It is unnecessary to do more than to make a short statement of the points. The purpose of the act of Congress was 'to encourage investments by exempting the investors from loss in excess of the fund he is willing to risk in the enterprise.' 26 F(2d) 24, Richardson vs. Harmon, 222 U.S. 96, 103. Hartford Accident & Indemnity Co. vs. Southern Pacific Co., 273 U.S. 207, 214. For this purpose no rational distinction can be taken between several persons owning shares in a vessel directly and making the same division by putting the title in a corporation and distributing the corporate stock. The policy of the statutes must extend equally to both. In common speech the stockholders would be called owners, recognizing that their pecuniary interest did not differ substantially from those who held shares in the ship. We are of the opinion that the words of the acts must be taken in a broad and popular sense in order not to defeat the manifest intent.

This is not to ignore the distinction between a corporation and its members, a distinction that cannot be overlooked even in extreme cases, Behn, Meyer & Co. vs. Miller, 266 U.S. 457, 472, but to interpret an untechnical word in the liberal way in which we believe it to have been used—as has been done in other

cases. International Stevedoring Co. vs. Haverty, 272 U.S. 50.

The other branch of the petitioner's argument seems to us a perversion of the California law. The effect of that law so far as it goes is to destroy the operation of a charter as a non-conductor between the persons injured by a breach of corporate duty and the members of the corporation, who but for the charter would be liable. As suggested in Flash vs. Conn, 109 U.S. 371, it leaves the members to a certain extent in the position of copartners. But that is the liability that the Acts of Congress mean to limit. Having no doubt of the comprehensive purpose of Congress we should not be ingenious to construe the California Statute in such a way as to raise questions whether it could be allowed to interfere with the uniformity which has been declared a dominant requirement for admiralty law.

Decree affirmed."

Throughout the litigation, the vessel owners and their stockholders, whose right to limitation has thus been vindicated, were represented by Lillick, Olson & Graham, while H. W. Hutton and the firm of Ford, Johnson & Bourquin represented Flink.

New Freight in General Average

EVERY so often our legal mills grind forth a decision tending to clear up some of the opaque borderland of general average. The latest effort in that direction is the case of St. Paul Fire & Marine Insurance Co. vs. Pacific Freighters Company, reported at 1929 A.M.C. 107. It has to do with an adjustment prepared by Geo. E. Billings Company and objected to by M. C. Harrison, former guiding star of the St. Paul, and one of the best little objectors the Coast ever saw.

The facts of the dispute were stipulated as follows:

"The respondent's vessel loaded an entire cargo of lumber, including a deck load, belonging to libellant's assignor, as per charter party and bills of lading, and the freight thereon was prepaid and considered as earned upon the loading thereof. The vessel thereafter proceeded on her voyage with all of said cargo on board. She experienced heavy weather, which caused her to leak and to jettison her deck cargo and to put into a port of distress for the safety of the vessel and remaining cargo, when she arrived, discharged the same and made repairs. Upon completion she reloaded the remaining cargo and took a new deck cargo to replace the jettisoned deck load, and received a new and additional freight therefor. She thereupon proceeded upon her voyage and arrived at her port of destination and there safely delivered her cargo. The vessel and cargo remaining on board after the aforesaid jettison were liable to contribution in general average ratably for the cost and expense of putting into the port of distress and the general average repairs to the said vessel, and such other general average expense incurred until she was again upon her voyage to her port of original destination. The cargo owner, prior to taking delivery of the cargo, signed a document, and a statement of general average was thereafter made.

The following question of law was submitted to the court:

Is the said vessel and her said remaining original cargo entitled to be credited pro rata for such extra freight received by said vessel and her owners at the port of distress as the result of the substitution of the new cargo for that portion of the cargo which had been jettisoned?

General Average Credited with New Freight

The above entitled cause having been submitted to the Court under a stipulation of facts and for determination of the question of law in said stipulation propounded, and providing that if the court should answer the question of law in said stipulation referred to in the affirmative, such interlocutory decree be entered in favor of the libellant with a reference to the United States Commissioner as the Court may deem proper;

And the said cause having been fully presented to the Court on briefs filed by the proctors for the respective parties, and due deliberation having been had, the Court finds that the question of law in the said stipulation propounded should be answered in the affirmative, and that the contributory value in general average of the vessel in the stipulation hereinabove referred to is the sum of forty-seven thousand five hundred and ninety-six and no/100 ($47,596.00), and that the contributory value of the cargo in said stipulation referred to is the sum of sixty-one thousand six hundred and sixty-two and no/100 ($61,662.00), and that the total general average expenses amount to the sum of eight thousand three hundred and seventeen and 62/100 dollars ($8,317.62).

Now, therefore, it is ordered that a decree in favor of the libellant and cross-respondent and against the respondent and cross-libellant be entered, and that the said cause be, and it is hereby referred to United States Commissioner Arthur G. Fisk to ascertain and report the gross amount of new freight received by

respondent and cross-libellant at the port of refuge referred to in the stipulation on which said cause was submitted and to deduct from the amount thereof the total amount of general average expenses incurred as hereinabove set forth, and to pro-rate the balance of the said new freight then remaining, between the libellant and cross-respondent and the respondent and cross-libellant in proportion as the contributory value of the vessel and cargo bears to the whole contributory value."

Irving H. Frank appeared for the St. Paul, while Pillsbury, Madison & Sutro represented the shipowners.

MIXED CARGO

The Study Class of the Marine Underwriters of San Francisco, at at meeting of February 18, was favored with an informal talk by Captain A. T. Hunter, operating manager of the General Steamship Corporation, upon the general topic of "Safety at Sea." The genial Captain, whose world-wide experience makes him an expert in his line, introduced his remarks by a brief discussion of modern devices for increasing the structural safety of vessels. In this connection he touched upon collision bulkheads, sealed hatch covers, fire prevention equipment, improved lifeboats and davits, and other innovations tending to reduce the hazard to life and property at sea.

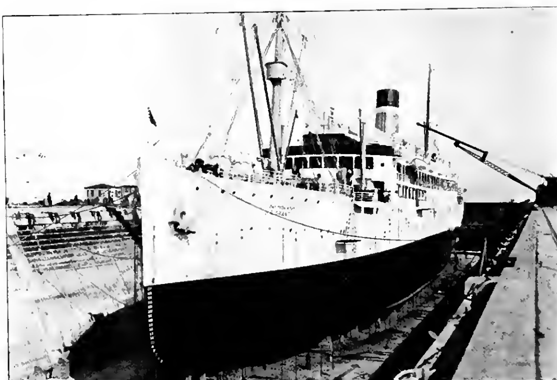
The speaker paid high tribute to the radio and the radio direction finder as aids to distressed vessels. In this connection he gave a graphic description of the rescue of the British freighter Antinoe by Captain George Fried of the Liner President Roosevelt. Captain Hunter, who was operating manager for the United States Lines in New York at the time, gained his information of this exploit first-hand through the report of Captain Fried.

At the meeting of March 4, Albert J. Porter, editor of the Shipping Register, delivered an inspiring address upon the development of ocean carriage under the title of "Clipper to Motorship." The major part of the discussion concerned the records of the clipper ship era with a special regard to Pacific Coast voyages. The speaker then traced the progress of ocean transportation through the paddle-wheel and modern steamer phases, concluding with an expression of his faith in the future of diesel propulsion. Mr. Porter is one of those rare individuals capable of extracting the background of romance from his subject in a manner pleasing to the most prosaic listener.

The second speaker of the evening was Ralph Bybee, foreign trade agent of the McCormick Steamship Company, who favored the class with an illustrated description of port conditions in South America. He showed three reels of motion pictures depicting scenes on waterfronts from Buenos Aires to Panama. Underwriting members of the class evinced keen interest in the details of handling coffee and linseed at Brazilian ports of shipment.

The pictures showed the Latin American freight handler as a paradox of progress. The waterfronts in the larger ports are equipped with electric cranes, carriers, and other modern devices. The railway cars used, though light in construction, are frequently equipped with tops which may be opened to allow cargo to be swung into them by the swing load directly from the vessel's hold. The belt conveyor systems in common use at the larger ports are also worthy of comment. Due to the scarcity of adequate berthing space, steamers are often forced to lie two or three deep at a port, and belt conveyors are employed to transfer bulk cargo to the outer vessel over the decks of the ships inshore. In the coffee ports these belt conveyors extend under the sidewalks for quite a distance in-shore from the ports, thus enabling the exporters to send his product to town by donkey-cart. The driver of the donkey-cart dumps the sacks through a hole in the sidewalk and that's all there is to it.

Archaic application of man power is in startling contrast to these evidences of mechanical ingenuity. As a link in the belt-conveyor system, stevedores are employed to carry the sacks of coffee or linseed for a distance of perhaps a city block, thus losing in time and effort most of the advantages gained in mechanical handling. Mr. Bybee also showed a picture of stevedores removing package goods from a single load, and observed that he checked their efforts and found that it took them twenty minutes to complete the job.



The U.S. Army transport U. S. Grant, here shown getting her periodical coat of Federal paint, is quite a sizeable vessel, but she makes no impression on the huge dock of the Bethlehem Shipbuilding Corporation at Hunter's Point, San Francisco, the only commercial graving dock, privately owned, in the United States capable of taking the new leviathans contemplated under the Jones-White Merchant Marine Act.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Some Recent Shipbuilding Orders

Great Lakes Engineering Works, River Rouge, Mich., has an order from the United States Gypsum Co., Chicago, for a steel motor boat 30 ft. 6 in. long, 6 ft. beam, to be powered with 65-H.P. gas engine, delivery April 15.

Manitowoc Shipbuilding Corp., Manitowoc, Wis., has an order for a steel yacht, owner not named, to be 78 ft. long, 15 ft. beam, 8 ft. 9 in. depth, 6 ft. draft; to be powered with 150-H.P. Fairbanks-Morse engine.

Nashville Bridge Co., Nashville, Tenn., is building two 100-ft. deck barges for stock.

Newport News Shipbuilding & Drydock Co., Newport News, Va., has an order from the Atlantic, Gulf & West Indies Co., New York, for two passenger liners to be 508 ft. long 70 ft. 9 in. beam, 39 ft. depth; to be powered by turbo-electric drive; keels to be laid next August and September.

This yard also has an order from the Dollar Steamship Company, San Francisco, for rebuilding and refurnishing the passenger accommodations of the President Harrison; also an order from the Chesapeake and Ohio Railroad Co. for two house barges.

Sun Shipbuilding & Drydock Co., Chester, Pa., has an order from the Sun Oil Company for two steel oil barges 188 ft. 6 in. long, 31 ft. breadth molded; 11 ft. 6 in. depth molded; 9 ft. draft; keels to be laid March 11 and 18.

General Engineering & Drydock Company, San Francisco, has been awarded contract by the United States Coast Guard Service for three cutters on a low bid of $839,-500 each. The boats are to be 250 ft. long, 42 ft. molded beam, 2000 tons displacement on 15-ft. draft; and to have turbo-electric machinery developing 3220 shaft horsepower.

The turbo-electric machinery is to be supplied by Westinghouse Electric and Manufacturing Co.

Bethlehem Shipbuilding Corp., Ltd., Union Plant, San Pedro Works, has an order for a 7000-barrel capacity steel bunkering barge for the Shell Oil Company of California, to be 131 feet over-all, 40 feet beam, 11 ft. 6 in. draft; equipped with high speed pumps driven by diesel engines.

Midland Shipbuilding Company, Midland Ontario, has an order from the Canadian Steamship Lines, Ltd., Montreal, for a bulk freighter, 582 L.B.P.; 60 ft. beam; 20 loaded draft; 12,000 D.W.T.; T.E. eng. 2800 I.H.P.; 3 Scotch boilers; 15 ft. 3 in. diam. 11 ft. 6 in. long.

Toledo Shipbuilding Co., Toledo, Ohio, has an order for a fireboat for the City of Detroit; 125 x 29 x 10 ft.; 14 mi. speed; comp. eng. 950 I.H.P. 2 Babcock & Wilcox boilers.

Dravo Contracting Co., Pittsburgh, Pa., has an order from the New York Central Railroad for five deck scows 100 x 53 ft. 8 in. x 9 ft. 7 in.; order from Geo. H. Breymann & Bros., New York, for two 1500 cu. yd. dump scows; order from Bank of Pittsburgh, Trustee, for thirty steel deck barges 125 x 26 x 5 ft. 6 in.; order from United States Engineers Office, Memphis, for 19 standard M.R.C. type steel barges and 6 standard M.R.C. type sand and gravel barges.

Prince Rupert Drydock & Shipyard, Prince Rupert, B.C., has an order from the Canadian Fish & Cold Storage Co., Prince Rupert for a fish packer 67 feet over all, 16 ft. 6 in. beam, 8 ft. 8 in. depth, to be powered with a 60 B.H.P. Fairbanks-Morse C.O. engine.

This yard has an order, also, foı two pilchard seine boats for Island Packing Co., Victoria, 65 ft. long over-all, 17 ft. 5 in. beam, 7 ft. 8 in. depth, each to be powered with a 75-H.P. Atlas-Imperial diesel engine.

Consolidated Shipbuilding Corp., Morris Heights, New York, has several new orders for cruisers: a 35-ft. runabout for R. H. Gallatin, to be powered with a 170-H.P. Speedway engine; a 75-ft. commuter boat for B. H. Borden to be equipped with two 300 H.P. Speedways; and a 66-ft. day cruiser for H. Murray to be powered with two 170-H.P. Speedway engines.

Defoe Boat and Motor Works, Bay City, Michigan, has received an order from A. V. Davis of New York for a diesel-powered steel yacht, keel to be laid in May. The yacht will be 138 ft. 6 in. between perpendiculars, 18 ft. beam, 5 ft. draft. She will be powered with diesel engines developing 1400 indicated horsepower and giving her a speed of 20 miles an hour.

This yard has an order for a steel yacht for M. H. Alworth of Duluth to be 135 ft. between perpendiculars, 22 ft. beam, 6 ft. 9 in. draft. She is to have diesel engines developing 600 indicated horsepower and 14 miles speed. Keel will be laid about April 1.

Marine Construction Co., Seattle, Wash., has an order from W. C. Nickum, naval architect of Seattle, for two Vincent self-dumping scows for Captain C. Croft of Seattle, to be 100 ft. long, 34 ft. wide, and 400 cubic yards capacity.

Cruiser Bids Called for May 28

The Navy Department, Washington, D.C., has announced that bids will be opened on May 28, noon, for the construction of Light Cruisers Nos. 33 and 35.

These are two of the cruisers designated to be built in private shipyards under the naval building program approved at the last session of Congress. Cruisers Nos. 32 and 34 are to be built in navy yards.

The cruisers will be similar to the Salt Lake City now building at the plant of the New York Shipbuilding Co. and the Houston and Augusta at the Newport News Shipbuilding & Drydock Company.

Shipbuilding Work in Prospect

Bids Opened for Matson Vessels

Bids for the construction of two liners for the San Francisco-Australasia service of the Matson Navigation Company, opened March 15 at the company's offices, 215 Market Street, San Francisco, were found to far exceed the amount the company estimated. What effect this will have on the building program for this line cannot be learned from company officials, but it is expected that specifications will be revised. This will be the same procedure followed in the placing of order for the Malolo.

Four bids were submitted for the building of the two vessels, that of the Fore River Plant of the Bethlehem Shipbuilding Corporation being the lowest, and is $1,500,000 more than the company estimated.

Other bidders were the San Francisco Plant of Bethlehem Shipbuilding Corporation, Newport News Shipbuilding & Drydock Company, and the New York Shipbuilding Company.

The new vessels will be 625 feet long on water line, 77 ft. 6 in. beam, 26,000 tons displacement; they are to have geared turbines developing 25,000 horsepower and driving the vessels at a speed of 20 knots. All auxiliaries are to be electrically driven. There will be accommodations for 460 first class, 200 second class, and 70 third class passengers, and the vessels will have 25,000 cubic feet of refrigerated cargo space besides the necessary cold storage space for ship stores. Plans for the vessels were prepared under the supervision of A. C. Diericx, vice-president of the Matson Navigation Company, in cooperation with the Navy Department, and assisted by G. K. Nichols, manager of engineering and repairs.

Dollar Line Plans Materializing

Definite date has not yet been announced for the opening of bids for the construction of two passenger and freight vessels to be built by the Dollar Steamship Company, 311 California Street, San Francisco, for the company's Oriental service. It is reported that the officials of the company are favorably disposed toward turbo-electric propulsion machinery which has proved so successful in the operation of the liners California and Virginia.

Representatives of various eastern shipyards are now in San Francisco and are working on designs for two vessels for this service and will submit them for the approval of the Dollar officials.

Panama Pacific Line to Build Additional Tonnage

Announcement has been received on this coast from P. A. S. Franklin, president of the Panama Pacific Line of New York, that his company plans the construction of three additional de luxe passenger and freight liners to augment the intercoastal service of the California, Virginia, and Pennsylvania. These three additional vessels will be similar to those now in operation.

Canal Package Freighter to be Built

Naval architect Henry J. Gielow, Inc., New York, is preparing designs for the construction of a fleet of self-propelled barges to be operated by the Great Lakes & Atlantic Transportation Co. of New York between Detroit and New York. The vessels are to be self-propelled, 250 feet long, 42 feet breadth, and 9 feet draft. They will be powered by diesel engines developing 2000 indicated horsepower. Carrying capacity of 300 automobiles or 2000 tons of package freight will be embodied in these barges. The estimated cost is $250,000 each.

Luckenbach Line to Refit Refrigerator Ship

The Luckenbach Steamship Company of New York has purchased from the Shipping Board the steamship Neponset for the sum of $120,000.

Reconditioning and repairs to cost not less than $375,000 and to include installation of a Bauer-Wach turbine and an Oertz rudder are a requirement of the purchasing order. This vessel is an oil-burning freighter of 9766 deadweight tons and is now laid up at New York.

New Tonnage for United States Lines

According to reports from New York, the two Shipping Board lines purchased by P. W. Chapman, Inc.—the United States Lines and the American Merchant Lines—will be consolidated under one management. Joseph M. Sheedy is executive vice-president.

The vessels will be designed by an advisory board of engineers and naval architects from the Newport News Shipbuilding & Drydock Co., Bethlehem Shipbuilding Corp., and New York Shipbuilding Company, headed by Theodore E. Ferris. The advisory board will give consideration in deciding upon propulsive power to the relative merits for this service of geared turbines, turbo-electric drive, diesel-electric, and straight diesel drive. It is stated that these two super-liners will exceed the Leviathan in size, speed, and hotel appointments and will be built with the idea of holding for the United States Lines a place in competition with the new 1000-footers being built abroad. It is hoped to award contracts for construction before the end of this year and to have the ships ready for service in 1932.

It is further announced that three smaller vessels of about 35,000 tons will be built after completion of the two super-liners above mentioned.

Tanker and Barges to be Built

It is reported from the Atlantic Coast that the Gulf Refining Company of Pittsburgh, Pennsylvania, has asked for bids to be submitted for the construction of a 10,000-ton tank steamer and two 180-foot barges.

Dredge to be Built for Willamette River

The Board of Army Engineers for Rivers and Harbors, Washington, D.C., are preparing plans for a new dredge for use on the Willamette River, a tributary of the Columbia River, to restore the approved channel depth as far as Salem.

Bull Line to Recondition Freighters

Sale of the Steamship Kosciuszko to A. H. Bull Company, New York, for the sum of $49,319 cash, was approved by the Shipping Board February 21, subject to an agreement that the purchasers will spend not less than $150,000 in reconditioning and bettering the vessel for ocean service. The betterments include the substitution of oil burning boilers for the present coal burners and the installation of accommodations for eight passengers.

This company for the sum of $48,955 cash, has purchased the steamer Cape Romain, with the understanding that not less than $150,000 will be spent on reconditioning and improving the vessel. Among the improvements will be a complete overhauling of the machinery, conver-

sion to oil propulsion, installation of a foremast with a thirty-ton boom, and the installation of additional winches. New passenger accommodations and a spacious cold-storage compartment are also planned.

The vessels are coal burning steel cargo ships of 7371 deadweight tons, equipped with Scotch boilers and reciprocating engines and designed to steam at ten knots.

REPAIR AWARDS

Bethlehem Shipbuilding Corp., Ltd., San Francisco, was recently awarded contract for over-haul to the U.S.A. transport U.S. Grant on a low bid of $55,897. Other bids submitted by San Francisco Bay yards are: United Engineering Co., $57,201; Moore Dry Dock, $58,329; and General Engineering & Drydock Co., $61,965.

Yarrows, Ltd., Victoria, B.C., was recently awarded contract for repair of damage to the British steamer Fishpool when she collided with the Japanese steamer Kayo Maru in Los Angeles Harbor. Bids submitted for this work were:

Los Angeles Shipbuilding & Drydock Corporation, San Pedro, $19,998;

Burrard Dry Dock Co., Vancouver, $21,000; Yarrows, Ltd., Victoria, $21,137; Bethlehem Shipbuilding Corp., $21,640; General Engineering & Drydock Co., $22,150.

Moore Dry Dock Co., Oakland, Calif., on a low bid of $129,568 was awarded contract for repairs to the Union Oil tanker Santa Maria, which suffered extensive bottom damage when she grounded at Antofagasta, Chile.

Other bidders were: Bethlehem Shipbuilding Corp., $141,350; Los Angeles Shipbuilding Corp., $138,-920.

Bids for the removal of the whaling tanker Washtenaw from the bottom of the main channel at Los Angeles harbor, where the vessel turned turtle and sank at her dock last fall, were opened March 1 by Major C. P. Gross, district engineer. Low bid for the work was submitted by Morris & Henderson at $42,500. Merritt, Chapman & Scott Corporation bid $44,850; and Crowley Launch & Tugboat Co., San Francisco, bid $46,000.

The Los Angeles Steamship Company has purchased the Shipping Board freighter West Lianga and will spend about $50,000 in conditioning the vessel for the intercoastal service of the Arrow Line.

Above is a photograph of the launching of a ferryboat for the Coronado-San Diego Ferryboat by The Moore Dry Dock Company, Oakland, Calif., on March 7. The boat is to have an 8-cylinder, 500-horsepower Atlas-Imperial diesel engine, direct-connected to 325 kilowatt Westinghouse generator.

Bethlehem Shipbuilding Corp., Ltd., San Pedro Works, will repair the damaged Japanese steamer Koyo Maru on a low bid of $31,-500. One other bid was submitted—$34,470 by the Los Angeles Shipbuilding & Drydock Corp.

Todd Dry Docks, Inc., 25 Broadway, New York, has announced receipt of contract for repairs to the United States Lines steamship George Washington on a low bid of $158,851. One other bid was submitted—$196,904 by the United Dry Docks, Inc.

Work on the liner, which is being done at the Tietjen & Lang Plant, calls for extensive reconditioning and repairs to boilers and engines.

KEEL LAYINGS

Twin screw diesel tug for Inter-Island Steam Navigation Co. by Bethlehem Shipbuilding Corp., San Francisco, Jan. 28.

W. W. Fischer, diesel towboat for General Sand Co., by Nashville Bridge Co., Feb. 15; four deck barges Jan. 10, Feb. 12, 21, Mar. 7.

Yacht for Fred J. Fisher, Detroit, by The Pusey & Jones Corp., Feb. 12; identical yacht for Alfred P. Sloan, Jr., New York, Feb. 12.

Blue Sunoco, tanker for Sun Oil Co. by Sun Shipbuilding Co., Jan. 14.

Steel utility boat for Brown Co. by Bath Iron Works, Feb. 25.

Wood yacht for K. T. Keller, Detroit, by Defoe Boat & Motor Works, Feb. 15.

LAUNCHINGS

Ferryboat for San Diego—Coronado Ferry Co. by Moore Dry Dock Co., Mar. 7.

Welded barge for Boston Molasses Co. by Federal Shipbuilding & Drydock Co., Feb. 22.

Steam towboat for Wheeling Steel Corp. by Howard Shipyards & Dock Co., Feb. 26.

Fernie, single screw package freighter for Canada Steamship Lines Ltd., by Midland Shipbuilding Co., Ltd., Feb. 28.

Ferry hull for stock by Nashville Bridge Co., Feb. 10; two deck barges, in Feb.

Tom Stallings, snag boat for Memphis River and Harbor District by Chas. Ward Engineering Works, Feb. 19; Dwight W. Davis, steam propelled towing boat to Inland Waterways Corp., Feb. 9.

DELIVERIES

Five barges to Crucible Fuel Co., Pittsburgh, by American Bridge Co., in Feb.

Two steel house barges to Merchants & Miners Transportation Co. by Dravo Contracting Co., three standard barges to Ohio River Sand Co., Louisville, one standard barge for stock during Feb.

Lighter hull for J. W. Sullivan Co., by Federal Shipbuilding & Drydock Co., Feb. 6.

One dredge and two deck barges by Nashville Bridge Co., Jan. 10; one deck barge Feb. 27.

In the opening of bids by the Shipping Board on March 11 for the purchase of the Gulf Brazil River Plate Line, the Munson Steamship Company of New York was high bidder for the sum of $2,695,672, or a deadweight ton of $28, the highest price yet offered for any government-owned freight line.

The first **Pacific Coast Pleasure Boat and Sportsmen's Exposition** will be held at the San Francisco Civic Auditorium from April 27 to May 4 of this year, and will be the largest and most complete exhibit of pleasure boats and their equipment ever held on the Pacific Coast.

Captain W. B. Voortmeyer, of Oakland, California, has petitioned the State Railroad Commission for permission to operate a speed boat passenger service between the Oakland Municipal Airport and San Francisco and the foot of Broadway, Oakland. The Oakland Harbor Board has already granted permission.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of March I, 1929

Pacific Coast

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length over-all; 30' beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28 est.

Hull No. 113, lightship, sister to above; keel Sept. 1/28 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BALLARD MARINE RAILWAY COMPANY,
Seattle, Washington

Mikimiki, hull J 91, tugboat for Young Brothers, Ltd., Honolulu; 115 L.B.P.; 28 beam; 12 draft; 11 knots speed; 1040 Fairbanks-Morse diesel engs.; keel Sept. 12/28; launched Jan. 15/29.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT
Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Hualalai, hull 5336, passenger and freight steamer for Inter-Island Steam Navigation Co., Honolulu; 295 L.B.P.; 27'6" beam; 17'6" loaded draft; 15 knots speed; 1200 D.W.T.; steam turbines; 4000 S.H.P.; 4 W.T. boilers, keel Dec. 17/28; launch Mar. 23/29 est., deliver June 1/29 est.

Humuula, hull 5338, steel passenger and freight steamer for Inter-Island Steam Navigation Company, Honolulu, 1100 Gr. tons; keel Mar. 18/29 est.

Not named, hull 5339, twin screw diesel tug for Inter-Island Steam Navigation Co., Honolulu; 117 L.O.A.; 28 breadth, 16 depth; keel Jan. 28/29.

Hull 5340, barge for Inter-Island Steam Nav. Co., Honolulu; keel Apr. 1/29 est.; launch May 9/29 est.

Hull 5341, barge for Martin Ship Service, San Francisco; launched Jan. 8/29; deliver Mar. 18/29 est.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A. Wanner.

Hull 19, tow barge for Standard Oil Co. (Calif.), San Francisco; 72 L.B.P.; 24' beam; 4' loaded draft; 100 D.W.T.

Not named, hull 20, fishing boat for A. Paladini, Inc., San Francisco; 65' L.O.A.; 16 beam; 6 loaded draft; 125 H.P. 5-cyl. Union diesel eng.; keel Oct. 19/28.

J. C. JOHNSON'S SHIPYARD
Port Blakley, Wash.

Cannery tender for P. E. Harris & Co., Seattle; 76 ft. long.

Scow for Pioneer Sand & Gravel Co., Seattle; 130x38x11 ft.

Two fish scows for P. E. Harris & Co., Seattle; 60 x 16 ft.

LAKE WASHINGTON SHIPYARDS,
Houghton, Wn.

Purchasing Agent: A. R. Van Sant.

Hulls 101 to 105 inc. six fish wooden scows. (Dup. Hull 101).

Hull 106, wooden cannery tender for Libby, McNeil & Libby, Seattle; 65 ft. long; one 110-H.P. Washington-Estep diesel.

Foshay, hull 107, steel passenger and freight motorship for Northland Transportation Co., Seattle; 186x35 ft. beam; two 550-H.P. Washington-Estep diesel engs.

THE MOORE DRY DOCK CO.
Oakland, California.

Purchasing Agent: N. Levy.

Not named, one steel, screw double-ended diesel-electric automobile ferryboat for San Diego and Coronado Ferry Co.; 190 L.O.A.; 43'6" breadth of hull at deck; 60' breadth over guards; 14'9" depth at sides, molded; 8'11" light draft, molded; keel Dec. 27/28; launched Mar. 7/29; deliver Apr. 20/29 est.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

Purchasing Agent: C. C. Labric.

One steel car barge for Canadian National Railways, Vancouver, B.C.; 270 x 42 x 12' depth; keel Sept. 12/28; launched Dec. 27/28; deliver Mar. 15/29 est.

Copello I, hull 27, halibut fishing boat for Dan Larsen; 52 L.B.P.; 13 beam; 5'6" loaded draft; 50 B.H.P. Bolinder semi-diesel engs.; keel Jan. 9/29; launch Mar./29 est.; deliver Apr. 29 est.

Not named, hull 28, fish packer for Canadian Fish & Cold Storage Co., Prince Rupert, B.C.; 67 L.O.A.; 16'6" beam; 8'8" depth; 50 D.W.T.; 60 B.H.P. Fairbanks-Morse C.O eng.; keel Mar. 15/29 est.

Not named, hull 29, pilchard seine boat for Island Packing Co., Victoria, B.C.; 65 L.O.A.; 17'5" beam; 7'8" depth; 75-H.P. Atlas-Imperial diesel eng.; keel Mar. 15/29 est.

Not named, hull 30, sister to above; keel Mar. 15/29 est.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twelve barges for Crucible Fuel Co., Pittsburgh; 175 x 26 x 11 ft.; 8 delivered.

Eight coal barges for West Kentucky Coal Co.; 175 x 26 x 11 ft.

Twenty decked barges for U.S. Engineers, Rock Island; 108 x 24 x 5 ft.

AMERICAN SHIP BUILDING CO.,
Lorain, Ohio

Purchasing Agent: C. H. Hirsching.

Not named, hull 804, bulk cargo vessel for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12½ mi. speed; T.E. eng. 2200 I.H.P.; 3 Scotch boilers, 14 x 12 ft.; keel Mar. 25/29 est.; launch June 8/29 est.; deliver July 29/29 est.

Not named, hull 805, sister to above; keel Mar. 4/29 est.; launch May 18/29 est.; deliver June 22/29 est.

BATH IRON WORKS
Bath, Maine

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer; keel Dec. 3/28; launch Apr. 10/29 est.; deliver May 1/29 est.

Hi-Es-Maro, hull 123, twin screw steel diesel yacht, Henry J. Gielow, Inc., New York, designer; 266'x35'x22' depth; 14'6" draft; two 1200 B.H.P. Bessemer diesel engs.; keel Nov. 14/28; launch May 8/29 est; deliver July 15/29 est.

Corsair, hull 124, twin screw steel steam turbo-electric yacht; 343x42x27ft., 18 ft. draft; 6000 S.H.P.; General Electric turbo-generators; Babcock & Wilcox boilers; keel May 20/29 est.

Not named, hull 125, steel utility boat for Brown Co.; 36ft. long; 40 H.P. Bolinder eng.; keel Feb. 25/29; deliver Mar. 15/29 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Not named, Hull 1422, single-screw coal collier for Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Not named, hull H-1424, steel passenger and freight steamer for New England Steamship Co., 1800 gro. tons.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; Winton engs.; General Electric generators and motors; keel Jan. 30/29.

No. 116, same as above; keel Feb. 6/29.

No. 117, same as above; keel May 1/29 est.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2921, 106-ft. cruiser for L. M. Wainwright, Indianapolis; 2 Speedway diesels, 300 H.P. ea. at 700 r.p.m., wt. 7500 lbs.; deliver May/29 est.

Hull 2923, 66-ft. cruiser for J. McMillan, Detroit, Mich.; 2 170-H.P. Speedway engs.; deliver May /29 est.

Not named, hull 2925, 64-ft. cruiser for Rear Admiral L. M. Josepthals, New York; 2 170-H.P. Speedway engs.; deliver May/29 est.

Not named, hull 2926, 76-ft. cruiser for Adolph M. Dick, New York; 2 300-H.P. Speedway engs.; deliver June /29 est.

Not named, hull 2927, 35-ft. fishing boat for Leon Goodman, Philadelphia; two 44-H.P. Speedway engs.; deliver June 1/29 est.

Hull 2928, 21-ft. coupe yacht tender for Arthur Wheeler, New York; 1-22-H.P. Speedway; deliver May 1/29 est.

Hull 1929, 16-ft. yacht tender for above; 1 Universal eng.

Not named, hull 2930, 106-ft. cruiser for W. C. Robinson, Pittsburgh; 2 Speedway diesel engs.; deliver May 15/29 est.

Hull 2931, 16 ft. yacht tender for above; 1 Universal eng.

Not named, hull 2932, 50-ft. fishing boat for Caleb S. Bragg, New York; 2 170-H.P. Speedway engs.

Not named, hull 2935, 35-ft., runabout for R. H. Gallatin; 170 H.P. Speedway eng.; deliver May 1/29 est.

Not named, hull 2936, 75ft. commuter boat for B. H. Borden; 2 300-H.P. Speedway engs.; deliver June 1/29 est.

Not named, hull 2937, 66ft. day cruiser for H. Murray; 2 170 H.P. Speedway engs.; deliver Aug. 1/29 est.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Yoreda, hull 131, steel yacht, for Aaron De Roy, Detroit; 105 L.B.P.; 17 beam; 6 loaded draft; 14 mil. loaded speed; 110 D.W.T.; 250 H.P. diesel eng.; keel Aug. 1/28; launch May 1/29 est.; deliver June 1/29 est.

Bonny II., hull 132, wood yacbt for C. W. Bonbright, Flint, Mich.; 61 L.B.P.; 13 beam; 4 loaded draft; 18 m.p.h.; 300 I.H.P. gas eng.; keel Oct. 15/28; launch Apr. 15/29 est.; deliver May 1/29 est.

Olive K., hull 133, steel yacht for C. F. Kettering, Detroit; 169 L.B.P.; 26 beam; 12 loaded draft; 15 knots speed; 600 D.W.T.; 1000 I.H.P. diesel engs.; keel Jan. 15/29, launch July 1/29 est.; deliver Aug. 15/29 est.

Verona J. hull 134, wood yacht for Albert A. Rose, Detroit; 75'6" I.H.P.; 14'6" beam; 14' loaded draft; 18 M.P.H.; 70 D.W.T., 500 H.P. gas eng.; keel Jan. 5/29, launch and deliver May 1/29 est.

Not named, hull 135, wood yacht for K. T. Keller, Detroit; 83 L.B.P.; 15'6" beam; 4'6" loaded draft; 14 M.P.H. speed; 82 D.W.T.; 300 H.P. Winton diesel engs.; **keel Feb. 15/29;** launch June 1/29 est.; delivery July 1/29 est.

Not named, hull 136, steel yacht for A. V. Davis, New York; 138'6" L.B.P.; 18 beam; 5 loaded draft; 20 M.P.H.; 150 D.W.T.; 1400 I.H.P. diesel engs.; keel May 1/29 est., launch Oct. 1/29 est.; deliver Apr. 15/30 est.

Not named, hull 137, steel yacht for M. H. Alworth, Duluth; 135 L.B.P.; 22 beam; 6'9" draft; 14 M.P.H.; 175 D.W.T.; 600 I.H.P. diesel engs.; keel Apr. 15/29 est.; launch Sept. 1/29 est.; deliver Nov. 1/29 est.

DRAVO CONTRACTING COMPANY,
Pittsburg, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'6" x 26'6" x 5' 6".

Hulls 691-694 inc. four steel carfloats for New York Central Railroad Co.; 270x38 x 10'5"; 850 gro. tons ea.; **three delivered.**

Hulls 795-799 inc.; 5 standard barges for stock; 130x30x7'6".

Hulls 800 to 809 inc.; 10 standard barges for stock; 100 x 26 x 6'6"; **one delivered.**

Talcott, hull 810, steel hull dredge for U.S. Engineers Office, Washington, D.C.; 620 gr. tons.

Hulls 811-815 inc.; five steel dump scows for American Dredging Co., Philadelphia; 112 x 34 x 12 ft.

Hull 816, steel oil barge for American Dredging Co., Philadelphia; 100 x 34 x 10'3".

Hull 817, one welded steel barge for stock; 100 x 26 x 6'6".

Hulls 821 to 825 inc.; 5 deck scows for New York Central R.R.; 100'x33'8"x9'7".

Hulls 826 to 827 incl.; 2 1500-cu. yd. dump scows for Geo. H. Breymann & Bros., New York.

Hulls 828 to 857 incl., 30 steel deck barges for Bank of Pittsburgh, Trustee; 125 x26x5'6".

Hulls 858 to 876 incl., 19 standard M.R.C. type steel barges for U.S. Engineers' Office, Memphis.

Hulls 877 to 882 incl., 6 standard M.R.C. type steel barges for U.S. Engineers' Office, Memphis.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 105, oil barge for Oil Tank Corp.; 146x34'8"x10'2¼" (welded barge); keel Nov. 1/28.

Hull 106, lighter hull for J. W. Sullivan Co.; 121x32'6"x13'4½"; keel Nov. 15/28; launched Jan. 19/29; **delivered Feb. 6/29.**

Hull 107, welded steel barge for Boston Molasses Co.; 60x20'4¾"x7'6"; launched Jan. 29/29.

Hull 108, same as above; **keel Jan. 31/29; launched Feb. 22/29.**

Hull 109, dredge hull for Gahagan Const. Co., 160 x 40x13'6".

GREAT LAKES ENGINEERING WORKS,
River Rouge, Michigan

Not named, hull 269, bulk freighter for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12 mi. speed; 12,000 gr. tons; TE engs. 2250 I.H.P. 2 W.T. boilers; keel Mar. 15/29 est.; launch June 15/29 est.; delivery Aug. 1/29 est.

Not named, steel motor boat for U. S. Gypsum Co., Chicago; 30'6" x 6' beam; 65 H.P. gas eng.; deliver Apr. 15/29 est.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1659, steam towboat for Wheeling Steel Corp.; keel Jan. 10/29; **launched Feb. 26/29.**

Hull 1660, lighthouse tender for U.S. Bureau of Lighthouses.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 244, diesel-electric dipper dredge for Great Lakes Dredge & Dock Co., 156 L.B.P.; 43 beam; 10 ft. draft aft; keel Aug. 30/28; launched Dec. 18/28; deliver June 1/29 est.

Pere Marquette 31, hull 246, car ferry for Pere Marquette Rail; Co.; 368 L.B.P. 57 beam; 17 loaded draft; 18 m. speed; 2 turbines; 3600 I.H.P. each; 4 Babcock & Wil-

cox W.T. boilers; keel Mar. 1/29 est; launch July /29 est.

Pere Marquette 32, hull 247, car ferry, sister to above; keel May 1/29 est.

Not named, hull 248, steel yacht, owner not named; 78 long; 15 beam; 8'9" depth; 6' draft; 150 H.P. Fairbanks-Morse eng.

MARIETTA MANUFACTURING COMPANY
Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Hull 235, sternwheel oil barge for Tropical Oil Co.; 203'x44'x5'6"; Marietta tamden comp. eng. 14"x28"x84"; keel Aug. 1/28; deliver Jan. 11/29 est.

MIDLAND BARGE COMPANY
Midland, Pa.

One dredge hull for M. H. Treadwell Co. of New York; 150' x 70' x 13'6". launched.

Four barges for Pittsburgh Plate Glass Co., Pittsburgh; 135x26x10 ft.

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Fernie, hull 23, single screw package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42'9" beam; 14' loaded draft; 12 mi. speed; 2200 D.W.T.; TE steam engs.; 1300 I.H.P.; 2 Scotch boilers, 14'6" dia. x 11' long; keel Dec. 4/28, **launched Feb. 28/29;** deliver May 1/29 est.

Not named, hull 24, bulk freighter for Canada Steamship Lines, Ltd., Montreal; 582 L.B.P.; 60 beam; 20 loaded draft; 11 knots speed; 12,000 D.W.T.; T.E. engs; 2800 I.H.P.; 3 Scotch boilers; 15'3" dia x 11'6" lg.

Midland Prince, converted to self-unloader; deliver May 1/29 est.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Hull 149, towboat for Standard Unit Nav. Co.; 92x24x5 ft.; keel May 10/28; launched Feb. 1/29.

Hull 161, ferry hull for stock; 150 L. B.P.; 62 beam; 8 loaded draft; keel Sept. 16/28; **launched Feb. 10/29;** deliver Mar. 10/29 est.

Hull 166, dredge for stock; 80 L.B.P.; 36 beam; 6 loaded draft; keel Nov. 15/28; launched; **delivered Jan. 10/29.**

Hull 167, deck barge for stock; 110 x 28 x7'3"; keel Dec. 15/28; launched; **delivered Jan. 10/29.**

Hull 168, deck barge for stock; 110 x 28x7'3"; keel Dec. 15/28; launched; **delivered Jan. 10/29.**

W. W. Fischer, hull 169, diesel towboat for Central Sand Co.; 120x26x5½ ft.; 720 I.H.P.; **keel Feb. 15/29.**

Hull 170, deck barge, 110x28x7¼ ft.; keel Dec. 7/28; launched; deliver March 10/29 est.

Hull 171, deck barge, 100x24x5 ft.; keel Dec. 12/28, launched; deliver Mar. 10/29 est.

Hull 172, same as above.

Hull 173, deck barge, 100x26x6½ ft.; keel Dec. 18/28; **launched;** deliver March 10/29 est.

Hull 174, same as above; **keel Jan. 10/29; delivered Feb. 27/29.**

Hull 175, ferryboat, for Cheatham Co., Tenn.; gas. eng.; 60x18x2¼ ft.

Hull 176, barge, 100x26x6½ ft.; keel Dec. 20/28.

Hull 177, tug, 50x12 ft.; 150 H P.

Hull 178, dredge, 100x36x8 ft.

Hulls 179-183 inc., 5 barges, 120x30x 7 ft.

Hull 184, deck barge; 180 x 40 x 9½ ft.; **keel Feb. 12/29.**

Hull 185, deck barge; 180 x 40 x 9½ ft.; **keel Feb. 21/29.**

Hull 186, deck barge; 180 x 40 x 9½ ft.; **keel Mar. 7/29.**

Hull 187, deck barge, 110 x 32 x 7¼ ft.; keel Mar. 14/29 est.

Hulls 188-189, two deck barges for stock; 100x24x5 ft.; keels Mar. 21-28/29 est.

Hulls 190-191, two deck barges for stock; 75x20x5 ft.; keels Apr. 3-7/29 est.

Hull 192, deck barge for stock; 120 x 30 x 6 ft., keel Apr. 2/29 est.

Hull 193, deck barge for stock; 110 x 28 x 7¼ ft.; keel Apr. 17/29 est.

Hulls 194-195, 2 deck barges for stock; 100 x 24 x 5 ft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Viking, hull 328, steel yacht for Geo. F. Baker, Jr., 272'1" L.O.A.; 36'6¾" beam; 18'6" depth; two turbine driven G.E. motors; 2 Babcock & Wilcox WT boilers; 1200 gross tons; 2600 S.H.P.; keel July 3/28; launched Dec. 15/28; deliver Apr. /29 est.

Pennsylvania, hull 329, 18 - knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Oct. 15/28; launch July /29 est.

City of Elwood, hull 331, diesel conversion for U.S. Shipping Board.

Ward, hull 332, diesel conversion for U.S. Shipping Board.

President Harrison, hull 333, reconditioning for Dollar Steamship Co., San Francisco.

Hulls 335-336, two house barges for Chesapeake and Ohio Railway Co.

Not namd, hull 337, passenger liner for Atlantic, Gulf and West Indies Nav. Co., New York; 508 x 70'9" x 39'; keel Aug. /29 est.

Not named, hull 338, sister to above; keel Sept. /29 est.

NEW YORK SHIPBUILDING CO.
Camden, N. J.

Purchasing Agent: J. W. Meeker.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; launched Jan. 23/29; deliver July 9/29 est.

Chester, light cruiser CL- 27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.

Santa Clara, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York, 482'9" long; 63'9" beam; 37'5" depth; General Electric turbo-electric machinery; keel Feb. 4/29.

THE PUSEY & JONES CORP.,
Wilmington, Del.

Purchasing Agent: James Bradford.

Acania, hull 1038, twin screw diesel yacht for Arthur E. Wheeler, New York; 126 L.O.A.; 21'6" beam; 8'6" app. loaded draft; 2 250-B.H.P. diesel engs.; keel Oct. 18/28; launched Jan. 26/29; deliver April 15/29 est.

Not named, hull 1039, oil tanker for Tide Water Oil Co.; 225 L.B.P.; 44 beam; 15'6" loaded draft; 10½ knots speed; 2300 D.W.T.; diesel-electric power; 1000 I.H.P.; keel Jan. 12/29.

Not named, hull 1040, yacht for Fred J. Fisher, Detroit; 236 L.O.A.; 34 beam; 19 depth; 2 1100 H.P. diesel engs.; keel Feb. 12/29.

Not named, hull 1041, yacht for Alfred P. Sloan, Jr., New York; same as above; keel Feb. 12/29.

Not named, hull 1042, yacht for owner not named; same as above; keel Mar. 12/29 est.

THE SPEAR ENGINEERS, INC.,
Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

John M. Dennis, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450-I.H.P. engs.; keel Feb. 18/28; launched Dec. 15/28; deliver Mar. 15/29 est.

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor. keel Aug. 18/28.

Not named, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P., keel Jan. 15/29 est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Maryland.

Purchasing Agent: W. J. Collison

Charles E. Evans, hull 264, fire and patrol boat for Commissioners, Washington, D.C.; 55' L.O.A.; 11'9" molded beam; 6'9" molded depth; 5' loaded draft; 31 D.W.T.; 100 H.P. Standard diesel eng.; keel Aug. 25/28, launched Nov. 22/28; deliver Apr. 1/29 est.

Not named, hull 265, steel hull, steam driven, patrol vessel for Supervisors of New York Harbor, 39 Whitehall Street, New York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam; 10'1½" mean draft; T. E. engs., Babcock & Wilcox W.T. boilers; keel Mar. 20/29 est.

STATEN ISLAND SHIPBUILDING CO.,
Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Dongan Hills, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel July 2/28.

Hull 782, barge for Grasselli Chemical Co.; 150 x 38 x 12'6".

Pittsburg, hull 684, dredge hull for Atlantic, Gulf & Pacific Co.; 162 L.B.P.; 44 beam; 15 loaded draft.

SUN SHIPBUILDING COMPANY,
Chester, Penn.

Purchasing Agent: H. W. Scott.

Not named, hull 116, passenger and freight motorship for American South African Line, Inc., New York; 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs.; keel Mar. 14/29 est.

Blue Sunoco, hull 117, tanker for Sun Oil Co.; 245 L.B.P.; 43 beam; 15'6" loaded draft; 8 knots speed; 2300 Bessemer diesel engs.; keel Jan. 14/29.

Hull 118, oil tank barge for Sun Oil Co.; 188'6" L.B.P., 31' breadth; 11'6" depth; 6000 bbls capacity on 9ft. draft; diesel-electric propulsion; keel Mar. 11/29 est.; deliver June 30/29 est.

Hull 120, sister to above; keel Mar. 18/29 est; deliver June 30/29 est.

TOLEDO SHIPBUILDING CO.,
Toledo, Ohio.

Purchasing Agent, Otto Hall.

Not named, hull 182, fire boat for City of Detroit; 125 L.B.P.; 29 beam; 10 loaded draft; 14 mi. speed; comp. engs.; 950 I.H.P.; 2 B. & W. boilers; deliver Aug./29 est.

TODD DRYDOCK, ENGINEERING & REPAIR CORP.,
Brooklyn, N.Y.

Purchasing Agent, H. J. Shannan.

Yorkville, hull 45, steel double-end ferryboat for City of New York, Dept. of Plant and Structure; 151 L.O.A.; 53 beam over guards; 37'6" molded beam; depth to top of beams 14'3"; draft 8'3"; steam engs.; keel Nov. 1/28; launch Mar. 15/29 est.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Dwight W. Davis, hull 69, steam propelled towing boat for Inland Waterways Corp., Washington, D.C.; 140x25x9 ft.; 2 500-H.P. Nordberg engs.; equipped to burn powdered coal, keel July 23/28; launched Feb. 9/29; deliver April 1/29 est.

Tom Stallings, 74, Western river type, steam driven 30-ton snag boat for Memphis River and Harbor District, U.S. Army engineers; 127'x30x4'4"; keel Nov. 27/28; launched Feb. 19/29.

Hull 77, mooring and fascine barge for U.S. Engineering Office, Memphis; 250 x 26 x 7 ft.

Hull 78, same as above.

Captain George, hull 79, single screw tugboat for U.S. Engineers office, Galveston; 65'6"x17'x7'7½"; 190 B.H.P. Winton diesel eng.

Repairs

BETHLEHEM SHIPBUILDING CORP., Ltd., Union Plant.

Drydock, clean, paint, misc. repairs: stmrs. Captain Gregory Barrett, President Adams, District of Columbia, President Garfield, K. R. Kingsbury, San Mateo, Everett, U. S. Grant, Lubrico, Solana, Esperanza, Progresso, R. J. Hanna, Point Montara, Frank D. Stout, J. B. Stetson, Lighthouse No. 70, Shell Co. Barge No. 6, tug Governor Irwin, ship Star of Alaska. Propeller repairs: tug F. A. Douty, stmr. W. S. Miller. Drydock and paint: stm. whalers Traveler, Port Saunders, Hawk, Hercules. Tailshaft repairs: stmrs. Point Sur, John C. Kirkpatrick. Misc. repairs: stmrs. Virginia, San Jose, Point Judith, Point Fermin, Limon, Tahiti, President Johnson, Washington, Mongolia, Thos. P. Beal, Capt. A. F. Lucas, Necanicum, Cliona, Myriam, Emma H. Coppage, Los Angeles, Tascalusa, Willwello, Tejon, Munleon, Royal Arrow, Levant Arrow, U.S.S. Rigel, Haviside derrick barge No. 3, m.s. Silveroak, Caliche, tug Sea Prince.

LOS ANGELES SHIPBUILDING AND DRYDOCK CORP.,
San Pedro, Calif.

Drydock, clean, paint, misc. repairs: stmr. Chiloil, Avalon, Satanta, Harvard, Dilworth, Chilbar, Dartford, Yale, m.s. Orkanger (no repairs). Alerations: m.s. Hopsborg.

PRINCE RUPERT DRYDOCK AND SHIPYARD,
Prince Rupert, B.C.

Drydock, clean, paint, misc. hull repairs: 2 scows. Docked, cleaned, painted, misc. hull and machinery repairs: 12 fishing boats. Misc. hull and machinery repairs not requiring docking: 43 fishing boats. 64 commercial jobs.

U.S. NAVY YARD,
Bremerton, Wash.

Misc. repairs and docking: New York, Maryland, Somers, Paul Hamilton, Stoddert, Mahopac. Misc. repairs incident to operation as district craft: Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.

"The C. E. has a friend here"

[illegible]

Who did What--and How

[illegible] trim steamer Mod[illegible]kert passed in through the Golden Gate flying the Netherlands flag, [illegible] pratique and warped [illegible] her [illegible] her maiden voyage to San Francisco [illegible] one of the first officers [illegible] Chief Engineer T. J. Van Straaten.

Operated [illegible] the Java-Pacific Line [illegible] Mod[illegible]kert, 8306 gross [illegible] crossed the Pacific on her first [illegible] San Francisco from the [illegible] East Indies in regu[illegible]

After [illegible] comprehensive [illegible] [illegible] under pilotage [illegible] the Java-Pacific [illegible] Van Straaten [illegible] with the [illegible] trip [illegible] taken in a [illegible] the stay of the Mod[illegible] Van Straaten [illegible] of the [illegible] And the Chief [illegible] world [illegible] century at [illegible]

The [illegible] able Chief Engineer [illegible] [illegible] of the Shell Oil Company's loading terminals at the port of San Francisco and San Pedro. The commendation was made following the delivery to the Mod[illegible]kerto of Shell lubricating oil at

Another delivery of Shell Marine Oils being loaded aboard the Motorship Brandanger at San Francisco.

San [illegible], and the loading of Shell [illegible] at San Pedro.

[illegible] and service is the Shell motto [illegible] the world," stated Chief Engineer Van Straaten as he [illegible] for the engine room as the Mod[illegible]okerto's whistle signalled departure for the long voyage to ports in the Far East.

"Shell oils are an important factor in perfect harmony in a vessel's engine room," reported Chief Engineer Sorelie of the motorship Brandanger.

The Chief was talking "shop" while the Brandanger lay idle at her berth, taking on a large consignment of Shell marine Diesel engine lubricating oil.

"There is no substitute for quality in lubricating oil, the same as any other product," continued the Chief, "and there is wonderful quality and the maximum satisfaction in every barrel of Shell oil."

"Shell oils have always given me and my engine room personnel the utmost satisfaction, and this results in much efficiency in the operation of my vessel and the efficiency that prevails in the propulsion department of the Brandanger," added Chief Engineer Sorelie.

Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

William P. Corrigan is now second assistant engineer aboard the William's Line intercoastal carrier Willhilo. For more than a year Corrigan, who is widely-known in Pacific Coast engineering circles, has been sailing the Atlantic.

Promotion for attention to duty has been conferred upon **James Bullock** and **Murdock Murray** of the **Dollar Line.** Bullock has been elevated to the position of superintendent engineer and Murray was promoted to the position of assistant superintendent engineer.

During the convalescence of Chief **U. Grant Rowley** of the Panama Mail liner Corinto, **James Burke,** former first assistant has been in charge of the propulsion department. Rowley is now rapidly on the mend and will return to his old berth on the Corinto on the next voyage. Rowley is senior engineer of the Panama Mail Line.

J. V. Young is now first assistant engineer aboard the **McCormick** freighter West Notus, and **George Gogin** is second assistant engineer aboard the same carrier.

Both are now sailing out of San Francisco after being aboard vessels sailing out of other ports for some time.

Emil Behrle is chief engineer of the West Notus.

After seven years with the **Matson Navigation Company, Fred R. Altman** has resigned as second assistant engineer on the Malolo to accept the position as boiler inspector with the Hartford Steam Boiler Inspection & Insurance Company.

The San Francisco port bill introduced by Senator Roy Fellom, its author, which would transfer control of the waterfront from the state to city was shelved by a vote of six to three.

Senator Christian of Hayward made the direct charge that the bill was a political football and declared that "interests of San Francisco's politicians are involved, not the interests of the people of San Francisco."

Chief Engineer John E. Hill.

Chief Engineer John E. Hill of the Canadian Pacific Railway British Columbia coastwise service, on his recent retirement after thirty years in this company, was honored at a meeting of his fellow engineers and presented with a purse of gold. Mrs. Hill was presented with a handbag and a bouquet of flowers.

John E. Hill joined this service in 1898 on the steamship Queen City, coming to the service from the Union Iron Works in San Francisco. He took out chief's papers over twenty years ago and has served in the capacity of chief engineer on practically every steamer of the Canadian Pacific British Columbia coastwise service, his last ship being the Princess Royal.

J. W. Kemp has been appointed to assist **E. S. McGrath** of Sudden & Christenson's Portland offices in the handling of the Arrow Line fleet. The agency was formerly handled by the States Steamship Company.

Retention of the name, **United States Lines** was announced by officials of the United States Shipping Board for the five vessels of the American Merchant Line and the six vessels of the United States lines recently purchased by P. W. Chapman, Inc., of New York.

Swayne & Hoyt, San Francisco, sold the freighters Point Judith and Point Lobos, each of 3700 tons, and the carriers are now flying the house flag of the **McCormick Steamship Company** in the coastwise trade.

The two freighters prior to purchase were operated by Swayne & Hoyt in the Gulf-Pacific service. The McCormick interests purchased the steamers to replace the cargo vessels Wahkeena and Ernest H. Meyer. The Point Judith and Point Lobos were built in 1918 in Portland, Oregon.

The genial smile and warm welcome of Captain James Sinnott that greeted all visitors to Crowley's Launch & Tugboat Co. at the foot of Howard St., San Francisco for nearly forty years is missing. Captain Sinnott passed away after a long illness last month. He had the distinction of being one of the first men employed by Thomas Crowley. From the days he was in short pants, Captain Sinnott spent his life along the San Francisco waterfront.

H. J. Wade, general passenger agent in London for the **Nippon Yusen Kaisha** is now on the Pacific Coast conferring with officials of the N.Y.K. He was greeted upon arrival at all Pacific Coast ports by officials of the company and during his visits to the various port cities has been extensively entertained.

Captain Lester J. Hall is now assistant manager of the Seattle offices of **Alexander & Baldwin.** He served for many years with the Matson Navigation Company, his last command being the steamer Maui.

It is expected that **Captain "Kan" Hubbennette** in command of the Manoa will be assigned to the Maui sometime this month.

There is much enthusiasm being evinced concerning the forthcoming Pacific Coast Motor Boat Show

the Hawaiian Islands. Captain Saunders will not return until around August 1, he stated before he sailed on the Malolo for Hawaii.

The **United States Army** will pass on bids for the purchase of the veteran troopship **Thomas**, now anchored in San Francisco Bay. Sale will be to the highest bidder. Tenders have been received in Washington for the purchase of the Thomas which has been continuously in service between San Francisco, Hawaii, and the Philippines since 1898.

Advices from New York state that the **California-New York Express Steamship Lines, Inc.**, of New York has been incorporated under the laws of Delaware with a capitalization of 2500 shares of common stock.

The value of the stock and the amount of capitalization was not revealed in the advices received on the Pacific Coast.

A request has been made by the **Port of Portland** to the **Army Engineers** to take over the work of maintaining dikes constructed near the mouth of the Columbia river by the port. The request stated that in view of the fact that the Army Engineers Office has built dikes at various points in the Columbia river below the mouth of the Willamette river and plans to construct others, the port commission holds that it would be advantageous for the government to take over dikes installed by the port. No report has been received by the port commission from the government regarding the request.

Progress during 1928 is shown in the report just made public by the **French Line.** The report, issued through the offices of **Pierre de Malglaive**, the company's general representative in the United States and Canada, shows that for the twelve months ending last year a grand total of 423,813 passengers, of which 182,692 were first and second cabin passengers, traveled on the French Line vessels in the transatlantic and Mediterranean services.

Six large liners were in the course of construction in 1928, plans for four others being drawn, one new office being opened in the United States and five other offices enlarged. A very decided increase over 1927 was shown during 1928, the French Line report revealed.

Joseph Moreno, popular secretary of the Marine Engineers' Beneficial Association, No. 35, of San Francisco.

D. E. Gould will leave the **American Mail Line** the first of April. He was Portland city passenger agent and also was identified with the Seattle offices. Gould plans to connect with another steamship line sometime this month, according to advices received by friends.

Shipmates of **Allen S. Gates**, third officer aboard the freighter **Horace Luckenbach**, are mystified over his disappearance while the steamer was off the Oregon Coast, March 15. When it came time for him to stand his watch no trace of Gates could be found, although an intensive search of the vessel was conducted.

Joseph Moreno, secretary of the Marine Engineers Beneficial Association, No. 35, of San Francisco, is one of the most popular maritime officials maintaining a shore-side position. For seven years "Joe" Moreno has been secretary of the organization.

"Joe" first went to sea in the steamer San Blas in 1899, when Thomas Sawdon was chief engineer. He started his sea career as an oiler. He served on more than ten ships, until he was appointed chief engineer of the fireboat David Scannell, a position he maintained until 1922, when he was elected secretary of the Marine Engineers.

When **George Armes**, president of the General Engineering and Drydock Company, San Francisco, alighted from the train at the Oakland mole and was greeted by a group of shipping officials, he was beaming like a school-boy who has just received a certificate of promotion.

And well might President Armes wreathe his face in smiles. He was the successful low bidder for the construction of three new Coast Guard cutters, which will cost in the neighborhood of $2,500,000.

President Armes' bid was in competition with the leading shipyards of the United States. Awarding of the contract means that the General Engineering yards will resemble an over-worked bee-hive during the honey season for some time to come. Last, but not least, several hundred additional men will be employed in the construction of the three new cutters.

To conform to the names of other vessels of the Williams Line intercoastal fleet, the motorship **Seekonk**, recently purchased by the company, has been rechristened Willmoto.

Pleased with his survey of Eastern terminals of the Company, **Roger Lapham**, president of the **American-Hawaiian Steamship Company**, has returned to San Francisco after a month's visit on the Atlantic Coast.

Harry Scott, president of the **General Steamship Corporation**, Pacific Coast representatives for the Westfal-Larsen Lines announces that commencing August, vessels of the line will be routed direct from Pacific Coast ports via the Panama Canal to Uruguay and Argentina. The present fast service will not be disrupted; the vessels now engaged in this trade will be replaced by faster vessels capable of following this course and yet reaching the river Plate in record time. Each new vessel will be capable of 14 knots speed and will be equipped with first class passenger accommodations for twelve passengers and with 60,000 cubic feet of refrigerator space.

The **Admiral Line** offices announce that the liner **H. F. Alexander** will resume service on May 10. The crack liner is now undergoing extensive overhauling, in-

cluding complete overhaul of her engines, and she will be refurnished throughout, the report stated.

Charles A. Perkes, assistant freight traffic manager for the **Dollar Line** in Shanghai is now visiting Pacific Coast offices and terminals of the company. Perkes has been in the Orient for several years and this is his first trip to the Pacific Coast in more than five years.

Appointment of **Howard W. Woodruff** as chief clerk for **Williams, Dimond & Co.**, has been announced by **Harold C. Smith**, district manager in Los Angeles. Woodruff has been for the last seven years office manager in Los Angeles for the McCormick Steamship Company.

Woodruff entered transportation work in 1916 as statistician with the Union Pacific Railroad in Portland. His first connection with a steamship company was with the Parr-McCormick Company in San Francisco. Later he was transferred to Seattle as assistant agent for the McCormick Steamship Company, and in 1922 he was sent to Los Angeles as assistant to Sam Y. Knight, district manager for the McCormick Steamship Company.

Herbert M. Stiles, chief wireless operator of the Panama Pacific liner California. Herbert is only nineteen years of age.

William H. Andrews, vice-president of the Los Angeles Transportation Club, with headquarters in the Alexandria Hotel, reports that the membership in the organization has greatly increased since the new club quarters were opened first of the year and that it is expected the membership will reach five hundred steamship and railroad officials before the end of the present year.

The second edition of "**Modern Valve Control Practice**," the title of the book issued by Cutler-Hammer, Inc., describing the C-H automatic valve control system, has just been published.

This new edition contains much additional information and data not included in the original book. Many new photographs show the use and installation of motor-driven valves. These views are grouped by applications graphically demonstrating the service rendered in power plants, water works, gas plants, etc. The text supplements the illustrations.

Considerable care has apparently gone into the making of this new book, and it should prove a valuable addition to every plant engineer's library. A copy will be sent free, upon request to Cutler-Hammer, Inc., 62 12th Street, Milwaukee, Wisconsin.

Trade Note

Page Brothers of San Francisco announce the incorporation of the firm in Oregon with Harald Carl, vice-president, managing the Portland office at 1114 Board of Trade Building and William S. Murison, secretary, managing the Seattle office at 907 Dexter Horton Building.

With offices in San Francisco, Portland, and Seattle, they are in a very good position to keep the Pacific Coast Freight and Charter market well covered.

Page Brothers have been very actively engaged as ship-brokers for the past fifty years and in that time have gained a very enviable reputation both here and in Europe. It has been their policy in the past, however, to confine their activities purely to chartering. The policy of the company, in order to meet changing conditions, is now amended, and it is their intention to not only continue with the full-cargo business but also to engage as parcel brokers and freight forwarders.

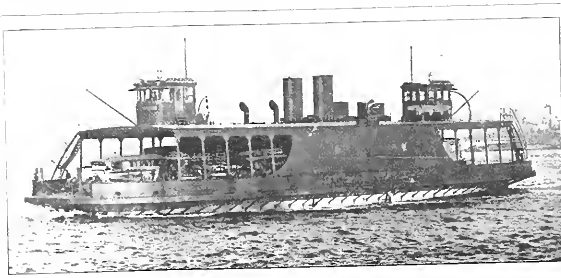
Trade Literature

Enjoy Yachting in Any Weather is the title of a beautiful little booklet recently published by **The Sperry Gyroscope Co., Inc.**, Brooklyn, New York, for the purpose of acquainting owners, builders, and designers of seagoing yachts with the advantages of the Gyro ship stabilizer. The book is beautifully printed on cream colored coated stock and well illustrated with graphs, tables, drawings, testimonials, and half-tone cuts of many beautiful yachts equipped with the gyro stabilizer. Some of the chapters deal with such subjects as: Advantages of stabilization; Stabilizing forces are gently applied; Waves cannot strain a stabilized ship; Mechanical simplicity; Operating principles; and testimonies of various users of the gyro stabilizer.

DIESEL-ELECTRIC FERRY

The boats of the Electric Ferries, Incorporated, operating between New York and New Jersey over the Hudson River, are demonstrating to the metropolis the benefits of diesel-electric propulsion. Two 350-horsepower Nelseco diesel engines, direct-connected to Electro-Dynamic Company generators provide power for a 580-shaft horsepower Electro-Dynamic Company main propulsion motor.

The six boats average 12 trips an hour, and average 3500 automobiles a day across the river. The trip requires six minutes. It is claimed that since these ferries started operation on November 8, 1926, not one boat has missed a trip due to engine trouble.



Trade, Traffic, and Shipping

(Continued from Page 147)

Alabama's State Terminal

(Continued from Page 147)

Agents of the Gulf-Pacific Line report the addition of two vessels to its service. Steamers leave Mobile at intervals of ten days, put in at New Orleans, westbound, and at Galveston and Lake Charles on the eastbound trip. The Transmarine Line has a direct service from Mobile to the Pacific Coast every 14 days. Luckenbach liners sail every two weeks from Mobile, taking cargo at Houston and New Orleans. The Redwood line maintains a similar schedule from Mobile.

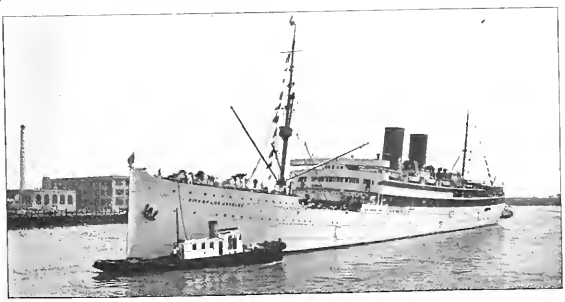
Mobile is served by five railroads; Louisville & Nashville, Gulf, Mobile & Northern, Southern Railway, Mobile & Ohio, and Alabama, Tennessee & Northern, all of which have equal connections with the joint interchange tracks, classification yards, and shipside tracks of the Alabama State Docks, in addition to terminals owned and operated by these several lines. The Alabama, Tennessee & Northern Railroad has a close working arrangement with the Frisco Lines, with which it is connected, forming a junction at Aliceville, Alabama. The Gulf, Mobile & Northern has a similar working agreement with the lines of the Burlington Route. With these and other connections the port of Mobile is well served throughout the Mississippi Valley, the west, the east, and the southeast, and enjoys preferential rail rates over a wide territory.

World's Steel Exports in 1928 27 per cent Over Pre-war Era

THE world's total exports of steel in 1928 reached a new high record, 27 per cent above the prewar trade in this basic commodity, the National Foreign Trade Council reports, presenting striking evidence that postwar rehabilitation has become a settled fact in the world's economy.

It was not until 1926 that steel exports were able to approximate the 1913 level. In the past two years, however, the trade has shown remarkable growth, beginning to make up some of the ground lost during the years that its normal expansion was interrupted. The five principal steel producers — Germany, France, Belgium-Luxemburg, Great Britain, and the United States—last year exported about 21 per cent of their joint production of approximately 100,000,000 tons.

"This outstanding evidence that steel is back again on the road of progress as a commodity in the world's markets," states the Council, "indicates that the thousand and one industries it serves all over the world have resumed their steady growth. It means that more rails are being laid, more bridges built, more factories renewed and reconditioned, more buildings erected, and an infinite variety of additional commodities — automobiles, machinery, tools, and equipment—are being made."



Steel exports of the five principal producers in 1913 totalled about 17,050,000 tons. In 1926 this figure was reached and somewhat exceeded with a joint export of 17,910,000 tons. The following year saw a jump to 20,477,000 tons and 1928 a further gain to 21,698,000 tons. The 1928 exports were divided as follows: Germany, 5,030,000 tons; France, 4,950,000 tons; Belgium-Luxemburg, 4,250,000 tons; Great Britain, 4,605,000 tons; United States, 2,863,000 tons.

The United States made the largest gain over 1927 of about 660,000 tons. Germany was next, with a gain of about 500,000 tons. Belgium-Luxemburg alone showed a loss, amounting to about 100,000 tons. While the United States is the largest producer of steel, it exports only about 6 per cent of its production, while Germany exports about 30 per cent, Great Britain and France more than 50 per cent, and Belgium-Luxemburg about 85 per cent.

The Council also indicates, as evidence of accelerating trade activity, the fact that more than $1,000,000,000 worth of additional export trade was carried on by the world's nations in excess of their 1927 business.

The six nations which carry on half the world's export commerce—Great Britain, Germany, France, Canada, Japan, and the United States—reported 1928 exports aggregating $16,343,000,000, a gain of 5 per cent over 1927. Germany made the largest gain, amounting to 15 per cent, while Canada's gain was 9 per cent, the United States 5 per cent, and Great Britain's 1½ per cent. France and Japan suffered slight losses.

The council will hold its Sixteenth Annual Convention in Baltimore April 17, 18, and 19, and on the basis of registrations already received, the largest attendance in years is expected, including executives from every section of the country and from every element of commerce and industry, agriculture and banking engaged in foreign trade.

Freight, Charters, Sales

March 15, 1929.

THE following steamers have been reported fixed with grain to the U. K.-Continent: Belgian str. Scheldestad, Vancouver to Portugal, 31/-, Mar./Apr., L. Dreyfus & Co.; British m.s. Jedmoor, Vancouver to Greece, 35/-, Apr.; British str. Callandia, Portland to Ireland, 31/3, Apr., Balfour Guthrie & Co.; British str. Ethelwolf, Portland or Puget Sound to Lisbon, 31/9, option Vancouver loading 31/6, Apr.; Italian str. Istria, North Pacific to Belfast and West Hartlepool, Mar./Apr., Canadian American Shipping Co.; British str. Benmacdhui, Vancouver to U.K.-Cont., $1.55, Apr., Canadian American Shipping Co.; German str. Taifun, British Columbia to U.K.-Continent, lump sum, Apr., Canadian American Shipping Co.

The following lumber fixtures from the North Pacific to Australia have been reported: Norwegian m.s. Brand, San Francisco and North Pacific to Australia, J. J. Moore & Co.; a steamer, Columbia River to one port Australia, $13, Apr., Pacific Export Lumber Co., and a steamer from British Columbia to one port Australia, Newcastle/Melbourne Range, $13, Apr. loading, same charterers.

The Japanese str. Hoyeisan Maru is reported fixed from Columbia River to Shanghai, $10.50, Mar. loading, Pacific Export Lumber Co.

The American str. San Pedro is reported fixed with ties and lumber from Eureka to Guaymas, San Jose de Guatemala, and La Libertad, Mar. loading, by the Hammond Lumber Co.

The following steamers are reported fixed with lumber from the North Pacific to the Atlantic; British str. Hartbridge, British Columbia to U. S. Atlantic port, option Montreal, Apr./May, H. R. MacMillan Export Co.; British str. Fishpool, British Columbia to North of Hatteras, option Montreal, Mar./Apr., Seaboard Lumber Sales Co.; American str. Maltram, North Pacific to one Port North of Hatteras, $14, Apr., E. R. Sizer & Co.; Danish m.s. Stensby, British Columbia to New York, Mar., Seaboard Lumber Sales Co.

The British Steamer Ben . . is reported fixed with wheat and lumber from the North Pacific to U.K.-Continent, four loading and two discharging ports, 32/6, Mar.

The British m.s. Cedarbank is reported fixed from San Francisco and the North Pacific to South Africa, by J. J. Moore & Co.

The following tanker fixtures are reported: Norwegian m.s. Hilda Knudsen, California to U.K.-Continent, 26/3, Feb./Mar.; British str. Lompoc, same, 26/-, Mar.; steamer, California to North of Hatteras, 68c.

The following time charters are reported: British str. Chelsea, delivery Japan, redelivery St. Lawrence via North Pacific, lumber, $1.05, H. R. MacMillan Export Co.; British m.s. Vinemoor, Pacific trade, 9 months, delivery Los Angeles, redelivered Australia, $1.55, Mar., American Trading Co.; British str. Sheaf Mead, one trip, delivered Shanghai, redel. U. S. South of Hatteras, via North Pacific, $1.15, Mar.; British str. Willesden, one round trip, delivered Muroran, redelivered Shanghai via North Pacific, $1.12½, Feb./Mar.; Norwegian str. Torvanger, delivered and redelivered British Columbia via Columbia River and Port Pirie, $1, prompt loading, Balfour Guthrie & Co.; British str. Wearpool, 5 months, delivered Puget Sound, redelivered U.K.-Continent, $1.35, Mar. Apr., Canadian American Shipping Co.; British str. Glentworth, delivery Cuba or Colon, redelivered North of Hatteras via North Pacific $11,750, March, H. R. MacMillan Export Co.; Norwegian str. Erviken, delivered and redelivered Japan via North Pacific, same charterers; British m.s. Glenmoor, continuation, North Pacific to Australia, $1.47½. American Trading Co.

The following sales are reported: American str. West Haven, U. S. Shipping Board to Los Angeles S.S. Co.; American str. Annie M. Reid, James Rolph & Co. to L. M. Thorne; American str. West Lianga, reported $100,000, United States Shipping Board to Los Angeles S. S. Co.; American str. Buford (to be scrapped), J. C. Ogden & Co. to Japanese parties; American strs. Point Lobos and Point Judith, Swayne & Hoyt, Inc., to McCormick S. S. Co.; American str. West Hembrie (to be renamed Pacific Oak), U. S. Shipping Board to Dimon S. S. Co.; American tkr. Radiant, Union Oil Co. to Gladstone Trans. Co. of New York; Panama m.s. Beulah, Society Island Line, Ltd. to Flood Brothers.

PAGE BROTHERS, Brokers.

Trade Literature

The Linde Air Products Company has published a booklet on **Oxwelding Pressure Vessels.** This is a reprint from "Oxy-Acetylene Tips" and portrays that the experience gained in construction of over two hundred pressure vessels has stressed the value of procedure control.

The booklet may be obtained by addressing the company at New York, Chicago, or San Francisco.

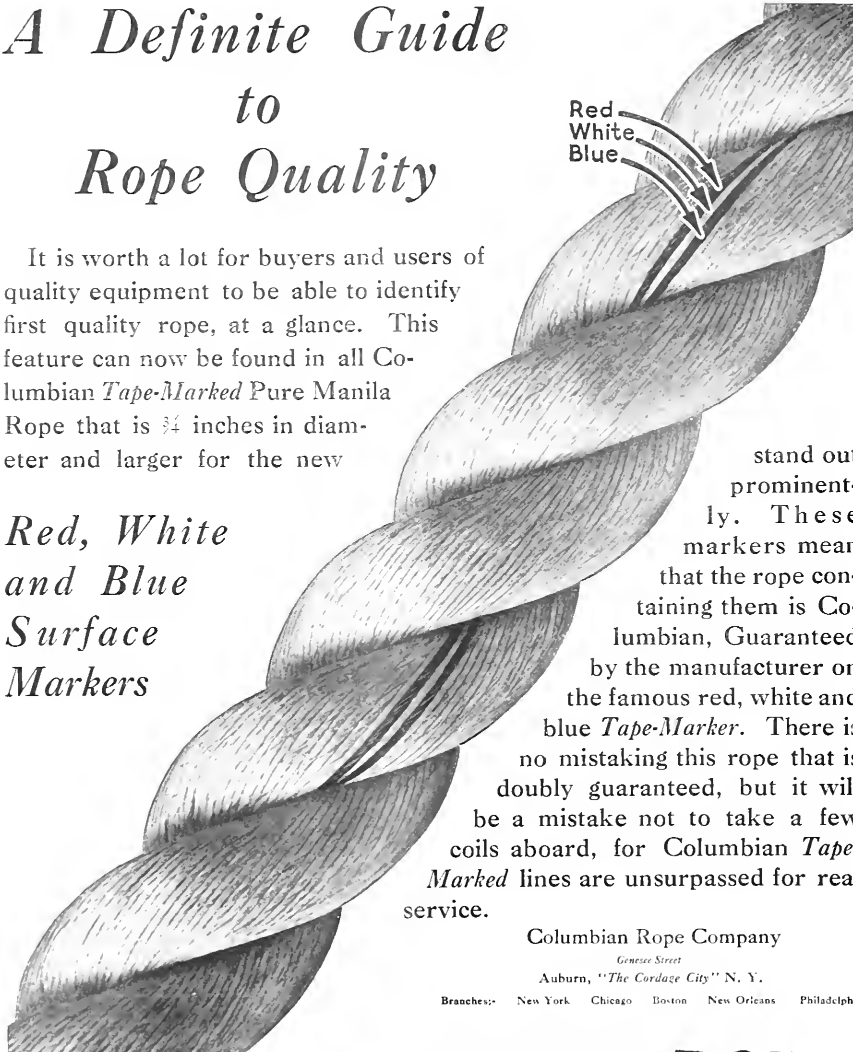
Dardelet Threadlock Corporation, 120 Broadway, New York, has published an unusual looking catalog describing and illustrating its Dardelet Threadlock—a true self-locking bolt and nut. The booklet contains but few pages, is printed on rough paper in large type, and besides describing the advantages and uses of the threadlock nut, lists the users of this product. The booklet may be obtained free on request.

Grays Harbor. The **Twin Harbor Stevedore Company** of Hoquiam, Washington, has published a book of information for the use of skippers entering Grays Harbor which gives much useful data concerning shipping regulations and harbor conditions, ship stores, government regulations, navigating and berthing conditions, and a shippers guide.

The Sharples Super Centrifuge for Diesel Fuel and Lubricating Oil is the title of a catalog just issued by **The Sharples Specialty Company** of Philadelphia.

The booklet contains 28 pages, nicely printed and illustrated, and gives the message of the Sharples oil purifier in very clear and adequently illustrated chapters. The booklet contains such chapters as a general one on Super centrifugal purification, Purification of fuel oil, Purification of Lubricating oil; Installation and operation; How it works; Types; Specifications and sizes; and pictorial sections illustrating installations afloat and ashore, particularly emphasizing installations in connection with diesel engines.

A Definite Guide to Rope Quality



It is worth a lot for buyers and users of quality equipment to be able to identify first quality rope, at a glance. This feature can now be found in all Columbian *Tape-Marked* Pure Manila Rope that is ¾ inches in diameter and larger for the new

Red, White and Blue Surface Markers

stand out prominently. These markers mean that the rope containing them is Columbian, Guaranteed by the manufacturer on the famous red, white and blue *Tape-Marker*. There is no mistaking this rope that is doubly guaranteed, but it will be a mistake not to take a few coils aboard, for Columbian *Tape-Marked* lines are unsurpassed for real service.

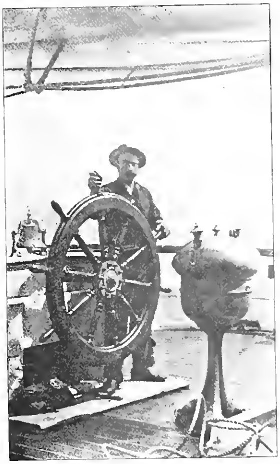
Columbian Rope Company
Genesee Street
Auburn, *"The Cordage City"* N. Y.

Branches:- New York Chicago Boston New Orleans Philadelphia

COLUMBIAN TAPE MARKED PURE MANILA ROPE

The Great Admiral

(Continued from Page 139)



NAVIGATING THE GREAT ADMIRAL

At the left is shown a quartermaster at the wheel of the Great Admiral. Note the beautifully carved pedestal for the binnacle.

At the right is shown Captain James F. Rowell "shooting the sun" on the voyage from New York to Melbourne in 1887. Both the illustrations are from photographs taken by a passenger.

Captain Rowell was very successful in his operation of this ship. Always vigilant, he carried all sail safely possible. In calms and in light or variable winds, he was continually shifting sail to catch the baffling breeze. The Great Admiral was very responsive to expert seamanship. In 1896, on her last out voyage from New York, she sailed up Storm Bay to Hobart, Tasmania. No pilot or towboat appearing, Captain Rowell brought his ship under sail right up to the wharf and moored her without a bump as readily as if she had been a steamer. The captain's daughter, with him at the time, states that this feat greatly astonished the large gathering of people who were on the wharf to meet the ship.

and cotton was laden for Liverpool, after delivery of which the ship returned to New Orleans in ballast, young Rowell being then second mate.

The Civil War had just started and when the Jarvis neared New Orleans she was captured by the Confederate steamer Music, she and the bark Ocean Eagle seized a half hour earlier being the first sea prizes of the war. The ship's company, with the exception of the captain, were imprisoned in the Parish Prison of New Orleans and were among the first prisoners of war taken by the Confederacy. After being incarcerated for about a month, with starvation fare and frequent threats of execution, they were turned loose in the streets to either starve or enlist in the Confederate Army. Young Rowell was fortunate in being allowed, although reluctantly, to work his way to Bordeaux on the Bangor ship Charles Cooper, then under the British flag. From Bordeaux the Cooper went to St. John, where Rowell was offered the berth of second mate; but the call of his country was too great and he enlisted in Company D, 26th Maine Infantry, serving under General Banks until mustered out in August, 1863, at Bangor. He then joined his old ship John H. Jarvis as second mate and, continuing a sea life, was appointed to his first command about 1873.

A paragraph from an article on the American Merchant Marine written by Captain Rowell about 1898, shows his spirit. It reads: "The writer may with propriety claim to be a typical American seaman. Typical in that he started to sea at the age of sixteen with a fair common school education, and passing through every grade, has commanded in the past twenty-five years the ships Zouave, Rainbow, Lightning, Thomas Dana, and Great Admiral. American, in that his ancestors settled in New England 268 years ago. A seaman, in that he was taught the business when the American ship was the pride of every seaman's heart and when their sails whitened every sea."

Captain Rowell retired from the sea when the Great Admiral was sold in 1897 and was employed by the Weld Estate in Boston until the time of his death at Malden, Massachusetts, February 1, 1903. As a man he was held in high esteem for his integrity, his intelligence, his culture, and for his kindly heart. In October 1867 he married Miss Emma Freeman, who with her two daughters, is now living in the southern part of California.

Outposts of the Air

A NEW value given the outlying possessions of the United States by the rapid development of air travel is emphasized in a report on Commerce and Economic Resources of Our Outlying Possessions and Territories which has just been issued by the Foreign Commerce Department of the Chamber of Commerce of the United States.

Alaska, Hawaii, the Philippine Islands, Porto Rico, Virgin Islands, Guam, American Samoa, and the Panama Canal Zone, as the report points out, ship to the United States $371,639,000 worth of their products and buy in this country goods to the amount of $273,181,000. But their value is not in trade alone.

"Our island outposts in particular," the report states, "have taken on a new importance with the rapid development of aviation and of communication. Previous to the World War the islands were of importance as naval stations, as coaling stations for the merchant and naval fleets, and as cable stations. While their significance in this capacity still continues, the public eye is perhaps directed at present more to their value as landing spots for present and future trans-oceanic fliers and as sites for the wireless towers of American radio companies."

The Problem of Absorption

Britain and America Should Create New Demands

By W. H. Harford*

AMERICA and England have lifted the standard of living to a higher point than that of any other peoples. It would be injurious to both if that standard fell, and it would be to the benefit of both if the standard rose. It would be immensely to the benefit of both if the standard of living in other countries could be brought to the level of America, or even to the level of Great Britain.

On the continent of Europe, speaking in general terms, the peoples do not see life through the same eyes as we do. They are more content with things as they are and the possessions they have. There is not the same desire amongst the masses for the amenities of life that have been made possible by the inventive skill and manufacturing ability that have transformed conditions within the last decade.

And when we look beyond Europe to Africa, India and the East, it is still more true that there are countless millions of people yet to be educated to the purchase and use of the products of modern machinery.

Since the war Britain has been re-organizing itself to a point when, hand in hand with America, it could take on the task of lifting the standard of living all over the world to the benefit of the peoples of the world and to the profit of Anglo-American manufacturers. The vast quantity of machinery installed in British factories, the millions of pounds subscribed by the public for new enterprises, the amalgamations that have taken place, and the growing adoption of rationalization, all go to prove that Britain has not lost its virility or efficiency.

In 1927 there were important amalgamations in banking, brewing, building, in the chemical industry, in insurance companies, in mining, in automobile construction, in newspapers, stores, and textiles. I have before me a list of the more important amalgamations effected in 1927 and involving a total capital of 275 million pounds. I do not know whether the total figures have ever been recorded.

But perhaps more important than all, Great Britain has been awakening to a realization of the need for more concentration upon modern marketing methods and modern advertising. This is the lesson we have learned in part and are continuing to learn from America. We have been forced to learn it by American activity in markets that formerly were largely monopolised by our own manufacturers. There can be no cause for complaint on our part that America has vigorously developed her export trade, and there is no reason why America should diminish her efforts to sell her goods all over the world. Britain has sold her goods all over the world. We carried our textiles and our steel wherever we carried the Union Jack, and we shall do so again. We shall learn from America the strategy of selling. We are learning it now. We shall learn the power of sound advertising. We are learning that now.

Anglo-American co-operation, Anglo-American understanding, Anglo-American friendship are necessities for civilization. Trade jealousies were a contributory factor in the commencement of the last war, but it is impossible to think that America and Britain cannot reach complete understanding and that there cannot be mutual recognition of the fact that Britain is a market for American goods, that America is a market for British goods, and that the world is a market for both British and American manufactured products.

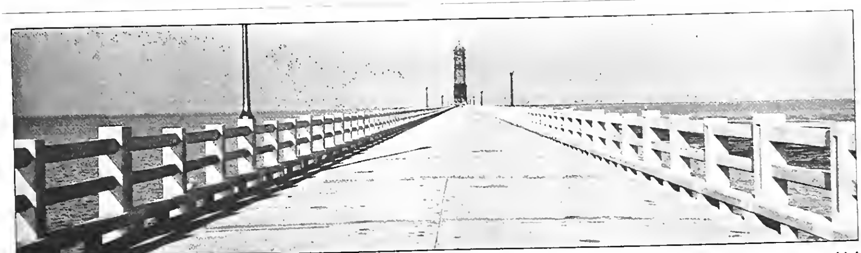
We shall both fight for markets but cannot we fight and be friends? Competition is the salt of trade. In all industries in this country, as in America, competing firms are fighting for trade. Individual competition is keener than at any time in industrial history, but there has been no period when competitors within an industry understood each other more and in which there were more mutual agreements regarding trade operations. Such an attitude can be translated into terms of national competition. It will be translated in that way when Britain and America thoroughly realize the new commercial truth that the more goods that are sold, the greater is the future buying capacity of the people. Wealth creates wealth.

Britain and America are both faced with the same problem. That problem is not a problem of production. The problem is one of absorption; of stimulation of demand.

Britain and America should remain rivals, but instead of thinking of themselves as rivals in the old sense, they should regard themselves as rivals in the task of stimulating demand and creating new desires. In that task they should fight and be friends.

—Anglo-American Trade.

*A Director of Saward, Baker & Co., Ltd.



View of the new San Mateo-Hayward highway bridge across San Francisco Bay, which was opened in March. This is the longest highway bridge in the world, being 7.1 miles long. It was constructed by the Raymond Concrete Pile Co., who employed Haviside Derrick Barge No. 4, equipped with wire rope manufactured by the American Steel & Wire Company in lifting the concrete slabs into position.

Honolulu Harbor

(Continued from Page 143)

"Kapalama Basin is the field for the expansion of Honolulu harbor. Before another legislative session Congress will undoubtedly have authorized the dredging of the canal to width ample for the larger ships to safely pass in and out of the basin. The wharves of that section, with railroad connections, serve the industrial center of Iwilei and shipments to country districts of Oahu.

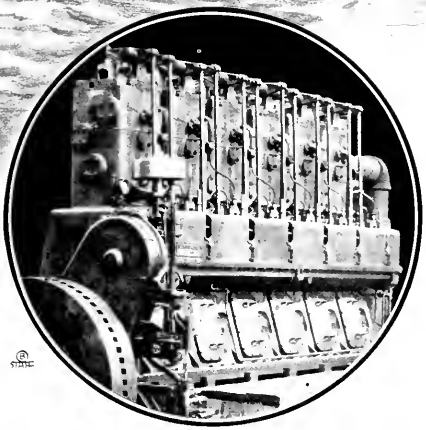
"Judgment has been entered condemning 235,809 square feet of land belonging to the Oahu Railway & Land Co. at the entrance of Kapalama Basin from Honolulu harbor. This action was taken after an option had been executed by the Oahu Railway & Land Co. to sell to the territory an adjoining 301,920 square feet of land immediately mauka (toward the mountains) of the parcel condemned. I cannot too strongly urge the authorization of the purchase of land now available at a fair figure so that the territory will control the frontage of the canal as it enters the basin up to the present wharves.

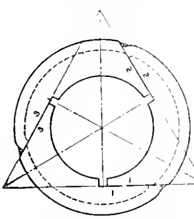
"Improvements have been completed in the Kewalo basin so that a large part of the fishing fleet is now accommodated there, and the hazard of the congested condition at Pier 15 removed from the main harbor."

"In Hilo harbor extensive dredging operations have materially assisted in perfecting that harbor. Federal work on the extension of the breakwater has continued. It is expected that future authorizations for dredging will enlarge the turning basin and provide a safe anchorage in the lee of the breakwater for commercial and naval ships.

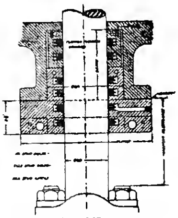
"The extension of Pier I in Kahului harbor and of the Claudine wharf give the island of Maui ample accommodation for handling all freight, including the increased pineapple shipments from that port. Extension of pineapple planting on the island of Molokai already makes it evident that the Kaunakakai wharf must be enlarged in order that the growers of pineapples may be reasonably protected in their shipments to Honolulu.

"The construction of a terminal for Nawiliwili harbor is fully under way. The contract for the first unit will soon be let. Dredging operations, under the direction of the federal government, have begun and will probably take the best part of a year before the harbor is sufficiently dredged to allow the entrance of deep-water vessels. Provision is made in the loan appropriation for the construction of additional units of the terminal so that the port will be properly equipped to accommodate the shippers as the dredging is advanced. Nawiliwili harbor furnishes an excellent base for hydroplane, the type of airships probably first used in inter-island commercial aviation."





Normal Position of Ring.



Type 255

Pacific Marine Review

The National Magazine of Shipping

MAY, 1929

Official Organ
PACIFIC AMERICAN

Official Organ
SHIPOWNERS' ASSOCIATION

Pacific Marine Review, Vol. 26, No. 5, Published Monthly at 576 Sacramento Street, in San Francisco, Entered as second class matter at the post office at San Francisco under the act of March 3, 1879.


Painting by Charles Robert Patterson.

American Clipper Ship Surprise

The Clipper Ship Surprise . . .

SURPRISE, first clipper ship built in East Boston, was delivered in 1850 from the yard of Samuel Hall to A. A. Low and Brother at New York. She was 183 feet 3 inches by 38 feet 8 inches by 22 feet; 1006 tons, new measurement. On her maiden voyage she made Clarke's Point, San Francisco, from the Sandy Hook Light, New York, in 96 days and 15 hours, the fastest passage up to that date. After twenty-five years successful operation, she struck on Plymouth Rocks, near the entrance to Yeddo Bay on the Coast of Japan, February 3, 1876, and was a total loss.

She had three commanders during her career, Captains Philip Dumaresq, Charles A. Ranlett, and Charles A. Ranlett, Jr.

WASHINGTON IRON WORKS

Alaska Run Gets New Motorship

with 4 Washington-Estep Diesel Power Plants

This summer will see a new vessel operating between Seattle and Ketchikan, Alaska. And the "W. B. Foshay" will represent the last word in design and equipment for craft of her kind, 186 feet long, she will have sleeping accommodations for fifty-four passengers and cold storage cargo holds.

For her safety, speed and operating success, the "W. B. Foshay" will depend on four Washington-Estep Diesel units. The main power installation will consist of two 8 cyl., 560 h.p. direct reversing engines. The auxiliary power will be provided by two 75 h.p. generating sets of 50 kilowatt capacity at 125 volts.

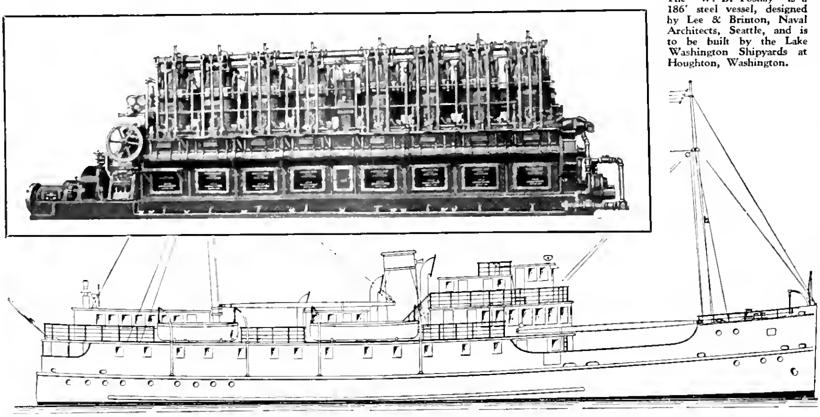
Removable Cylinder Liners
Open Side Main Frame
Pistons Removable from Bottom of Cylinder
Extra Large Caged Valves
Deep-Rigid Engine Base
44-1800 Brake Horsepower

REPRESENTATIVES

British Columbia Representative: Vancouver Machinery Depot, Ltd., Vancouver, B. C., Canada. **Honolulu Representative:** Perine Machinery Company, Inc., 610 Stangenwald Bld, Honolulu, T. H. **Oregon Representative:** F. C. Purinton, Phone 62, Tigard, Oregon. **Eastern Representative:** Sexton Engineering Corporation, 136 Liberty Street, New York City, N. Y. **California Agents:** W. H. Worden Co., Inc., San Francisco, Calif.; Ward-Livesly Co., Los Angeles, Calif. **Southern Representative:** Eclipse Engineering Co., 321 Chartres Street, New Orleans, La.

WASHINGTON IRON WORKS
SEATTLE, U. S. A.

The "W. B. Foshay" is a 186' steel vessel, designed by Lee & Brinton, Naval Architects, Seattle, and is to be built by the Lake Washington Shipyards at Houghton, Washington.



"WASHINGTON-ESTEP" DIESEL ENGINES

Pacific Marine Review

The National Magazine of Shipping

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

Entered as second class matter June 20, 1913, at the post-office, San Francisco, under the Act of March 3, 1879. Entire contents copyright, 1928, by J. S. Hines. Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 15th. Subscription price, a year; domestic, $2; foreign, $3; single copies, 25c.

Official Organ
Pacific American Steamship Association

James S. Hines,
President and Publisher.

Bernard N. De Rochie,
Vice-Pres. and Manager.

Official Organ
Shipowners' Association of the Pacific

Alexander J. Dickie,
Editor.

Paul Faulkner,
Advertising Manager.

A California School Ship

THE changing conditions in our American merchant marine require a high quality of brains and efficiency to manage and operate the ships of our merchant fleet. The glory of the days of sail has passed and today a merchant ship is an intricate structure of steel and mechanical equipment, that requires a degree of technical training not now generally provided by any state or governmental agency.

The Merchant Marine Act of 1920 requires, as an aid to our United States Navy in case of national emergency, fast, modern, and efficiently equipped vessels that may be used by our government when the necessity arises, and it is easily understood that the ships would be of little value unless trained officer personnel were as readily available as the ships themselves.

Our national government, anticipating in some degree at least the need of trained officers, passed an Act on June 20, 1874, to encourage the establishment of public marine schools, and on March 4, 1911, that Act was amended to provide details of naval officers as instructors, and provided an annual appropriation of $25,000 and an equipped ship to certain states that had approved by appropriate legislation and recognized this system of nautical instruction and agreed to pay their proportionate share in maintaining such nautical schools.

These schools established on the Atlantic seaboard have produced nautical school graduates that have made national reputations for themselves not alone as officers in our merchant marine but as officers in the United States Navy, Marine Corps, and in certain private corporations in need of technically trained men.

But the expansion of our merchant marine has been faster than has been that of the officer personnel, and at the present time there is not a sufficient supply of technically trained officers to man our ships with American officers and seamen.

The Pacific Coast is growing in merchant marine importance. New ships and new firms are rapidly being located in Pacific Coast cities. In order to provide this coast with adequate facilities for training merchant marine officers a bill (No. 253 as amended) was introduced in the Assembly during the present session of the California State Legislature. This bill has passed the lower house and is now before the Senate with endorsement by the Senate Finance Committee.

Providing for an appropriation of $150,000 for two years, or $75,000 per year, this bill, if it becomes law, would make the nautical school a part of the State Department of Education and its executive head would be the Superintendent of Public Instruction. The management of the school ship would be placed under a commission of five men appointed by the Governor, three of whom would be practical steamship men, one a business man, and the other the Superintendent of Public Instruction. It is hoped that the State Legislature will see fit to pass this bill as the Pacific Coast greatly needs a properly equipped nautical school.

Heretofore, the custom in providing these school ships on the Atlantic seaboard has been to use an old warship that has outlived its usefulness. It is proposed on the Pacific Coast to secure a merchant steamship from the United States Shipping Board and to have this vessel equipped with all the necessary merchant marine equipment, including fast winches, scientific fire control apparatus, radio, and all the modern equipment required at the present time on a merchant ship. A vessel of this character will give the students a merchant marine education rather than a naval education. The naval education as to discipline will be provided naturally by naval officers who are detailed as instructors on the vessel. This dual arrangement will produce officers not only trained in the navy but also in the navigation, management, and operation of a modern merchant vessel.

The ship, itself, will not be a San Francisco school ship, but a school ship for the State of California. She will make her cruise from one port to another on the Pacific Coast and elsewhere as occasion requires. Students will be selected from the high schools of the several counties in the state and thus our growing youth will contact the sea and gain a greater appreciation of the seagoing professions.

With a school ship as part of the state's system of education, naturally highschool boys who are ambitious to use the sea as a profession will have that course of education as part of the curriculum that will fit them to pass certain examinations that will be provided as a prerequisite for admission to the school ship.

The question of finance is a matter of great importance to the state, and some fear is expressed that $150,000 is too great a sum to ask of the state at this time. It is to be remembered, however, that in return for this appropriation the State of California will secure a ship and her equipment valued at upwards of half a million dollars and that the federal government provides an appropriation of $25,000 per annum and also provides the trained personnel who act as instructors. As a matter of dollars and cents, therefore, regardless of the training of our youth and the importance to our merchant marine, the State of California will be amply repaid for this appropriation of money.

The ship-owning and ship-operating industries of the Pacific Coast are looking forward with a great deal of anxiety in this matter and earnestly hope for favorable action on this bill from the California Legislature.

Slow Freight

On April 18, J. J. Falkenburg delivered an address at the Sixteenth National Foreign Trade Convention, Baltimore, on Progress in the Far East, "based on recent personal studies and observations at first hand." He reviews in a very masterly way the progress in the recent past, the present conditions, and the future possibilities. He is very optimistic over the export situation, and makes a plea for a continued stressing of reciprocity through increasing of imports. We must buy more from the Orient in order that the Orient may buy more from us.

We cannot refrain, however, from noting the closing remarks, which read as follows:

"I have purposely refrained from reminding you that the Department of Commerce states that our trade with the Orient is increasing at the rate of $80,000,000 per annum; also that Seattle is the 'Gateway to the Orient,' being **five sailing days nearer Yokohama than is San Francisco.** That conditions in all Far Eastern Countries are the best that they have ever been for our trade. That there is less ill-feeling and a more stable condition in Asia than at any time recently, and that the opportunity for our trade increase was never so good. You can read all this in **Commerce Reports** and the daily newspapers."

The emphasis is our own, and we call attention to this peculiar statement because we feel that it is an unwarranted slander on the American merchant marine. The actual distance from Seattle to Yokohama is 4320 miles, while from San Francisco to Yokohama it is 4750 miles, giving a difference of 430 miles. We admit that the average American freighter is rather slow compared to the fast modern carriers of many of her competitors, but we are not yet prepared to admit that her average speed is only 3.6 miles an hour, and we are curious to know whether "Commerce Reports" ever inferred that such was the case.

A Sensible Business Program

As we go to press the Chamber of Commerce of the United States is convening in annual meeting—April 20—at Washington, D.C. For some months past the Committee on Transportation and Communication of this body has been studying American merchant marine problems and this committee has prepared and submitted a report on which the Chamber will be asked to act at the Washington convention.

This report recommends a number of very commonsense measures calculated to supplement the Merchant Marine Act, 1928, and to help the American merchant marine get a better chance to compete in foreign trade.

In brief its recommendations are:

The scrapping of 442 obsolete vessels in the laid-up fleet now costing the United States Government $2,000,000 per annum for maintenance.

Elimination of Panama Railroad Steamship Company (government-owned and operated).

Withdrawal of Shipping Board from marine insurance business.

Discontinuance of Army Transport Service.

Disposal of remaining Shipping Board services by sale or by contract with private lines for their operation.

Maintenance of a reduced Shipping Board as a regulatory agency.

Revision of navigation laws and laws affecting the Steamboat Inspection Service.

Transfer of duties of Department of Treasury affecting vessel measurement to Department of Commerce, and standardization of national and international measurement rules.

Certain revisions of Seamen's Act.

Service discharge books for all seamen.

Adoption of Hague Rules on simplified bill of lading.

Adjustment of Panama Canal tolls in proper relation to costs.

Maintenance of Naval Reserves on adequate basis.

Free sale of United States registry ships to aliens.

Adoption of model marine insurance law.

We congratulate the committee on this report and hope not only that the Chamber of Commerce will heartily endorse these recommendations, but that they will so impress them on Congressional committees that some beneficial action will result.

Twenty-Five Years Ago

In May, 1904, Pacific Marine Review carried the following interesting items:

Captain Trowbridge has been appointed to command the steamship Minnesota when she sails on her maiden voyage, July 4.

Some interesting experiments were conducted last month between the United States revenue cutter Grant and district stations of the Pacific Wireless Telegraph Company. The cutter Grant can be communicated with satisfactorily at almost any point within a radius of 30 miles from any one of the coast stations.

Practically the entire British Columbia salmon pack to Europe for this season has been secured by Alfred Holt & Co.'s steamers. The rate is reported to be 35 shillings to Liverpool, with the customary rebate of 10 per cent at the end of the season.

An advertising card reads: "Ira A. Campbell, Proctor in Admiralty, Bailey Building, Seattle."

Eastern press telegrams report that the Hamburg-American Line is projecting a new liner of 35,000 tons gross for the Atlantic service. This will exceed by nearly 1100 tons the steamer Baltic, at present the largest White Star steamer afloat.

National Council of American Shipbuilders

THE activities of the National Council of American Shipbuilders have increased to such an extent and the demands upon it have become so many and of such a varied and important character that its board of directors has decided to reorganize the council to enable it to perform these increasing obligations.

Under its original plan of organization, the classification of members included individual membership composed of persons, copartnerships, and corporations engaged in building or repairing vessels; organization membership composed of associations whose members are engaged in building and repairing vessels; and allied industries membership composed of persons, copartnerships, and corporations engaged in manufacturing or furnishing equipment or materials used in building, repairing, or operating vessels. These classifications have been retained, and to them have been added association membership composed of associations which are not included under the classification of organization membership and whose members are interested in the development of an American built and owned merchant marine; associate membership composed of persons, copartnerships, and corporations respectively engaged in operating vessels, or in designing or financing their construction, or in insuring their builders or repairers against the risk involved in their construction or repair; personal membership composed of persons who are not included in the preceding classifications but who desire to aid the council in the accomplishment of its objects and purposes; and honorary membership composed of persons who have contributed distinguished service either in the development of the art of shipbuilding or in the promotion of the American merchant marine.

The most important change in the organization of the council has been to provide for the appointment of a president who will be its chief executive officer and will supervise its activities and formulate its policies. The council has been most fortunate in inducing H. G. Smith to become its president. He is a graduate of the United States Naval Academy and afterwards was in service as a naval constructor and subsequently was active for many years as a practical shipbuilder. His ability, technical training as a naval constructor, and wide and varied experience in the construction of naval and merchant vessels of all types combine in rare adjustment to qualify him to become the leader of the organization that is representative of the shipbuilding and allied industries.

At its annual meeting, the council elected directors and officers who are truly representative of the shipbuilding industry in all of its branches composed of the following:

Officers

President, H. G. Smith;

Vice-president, F. P. Palen;

Secretary, C. C. Knerr;

Counsel and treasurer, Henry C. Hunter;

Executive Committee: F. P. Palen, C. L. Bardo, Robert Haig, George H. Bates and C. W. Middleton.

Directors

William S. Newell, Bath Iron Works;

Warren Johnson, Johnson Iron Works, Dry Dock & Shipbuilding Corp.;

George W. Roper, Norfolk Shipbuilding & Dry Dock Corp.;

C. Stewart Lee, Pusey & Jones Corporation;

L. Y. Spear, Nelseco Plant, Electric Boat Co.;

S. W. Wakeman, Bethlehem Shipbuilding Corp., Ltd.;

F. G. Morley, Great Lakes Engineering Works;

C. L. Bardo, New York Shipbuilding Co.;

Homer L. Ferguson, Newport News Shipbuilding & Dry Dock Co.;

Robert Haig, Sun Shipbuilding Co.;

D. W. Niven, General Electric Co.;

I. W. Jackman, Worthington Pump & Machinery Corp.;

A. E. Ballin, McIntosh & Seymour Corp.;

C. W. Middleton, Babcock & Wilcox Co.; and

M. B. Lambert, Westinghouse Electric & Mfg. Co.

The New York and New Jersey Dry Dock Association and Pacific Coast Dry Dock Association are organization members of the council and each will appoint a director to serve as its representative on the board.

The Council has leased offices at 11 Broadway, New York City.

Knots per Hour

DISTANCES run at sea are measured in nautical miles (6080 feet). In common parlance, this distance has come to be called a knot and we speak of a ship's speed as so many knots per hour. Many modern seafaring men, and all landlubbers bother us with questions as to "How did the logical abbreviation 'Naut,' become knot?" "Where did the word knot come into this connection?" And so on, ad nauseam. For their information we quote the following description of a once useful but now out of date apparatus:

"CHIP LOG, a device now restricted to a few sailing vessels. It consists of a wooden quadrant about 5 inches in radius with lead placed in the circular edge which causes it to float upright. It is made fast to a log line by a three part bridle. The part fitted to the upper corner has a socket and a pin which pulls out when a strain is placed upon it with the desire to haul it aboard. The chip is cast over (streamed) with the pin in position. The first 15 or 30 fathoms of line is called the stray line which is marked by a piece of red bunting. The line from this point is divided into parts of 47 feet 3 inches each, called a knot. They are marked by pieces of cord tucked through the strands with knots in their ends corresponding to the number of knots out. Each knot is subdivided into fifths and marked with a white rag. The log line is allowed to run out while a 28-second glass is emptying itself. The result is the rate of speed of the vessel. The length of the knot was derived from the proportion that one hour (3600 seconds) is to 28 seconds as one nautical mile (6080 feet) is to the length of a knot (47 feet 3 inches).

The clipper ship Flying Cloud off Cape Horn once ran out eighteen knots and there was still a little sand in the glass."

[Glossary of Sea Terms. By Gershom Bradford]

From Webster's New International Unabridged Dictionary we glean the further information that the knot length of 47 feet 3 inches in conjunction with a 28-second glass was American and British naval practice. Elsewhere the knot was 50 feet 8 inches used in conjunction with a 30-second glass.

On a Windjammer of the Late Eighties

A Voyage in the J. B. Brown from Puget Sound to West Coast of South America, and Some Adventures at Callao and Panama

Yarn Spun by James A. Casey, A.B.

THE J. B. Brown was a full-rigged ship, built at Kennebunk, Maine, in 1874. Her original hailing port was Portland, Maine, and her first years were spent in general trade. After her arrival in San Francisco in February 1888, following a long passage from Antwerp, she was purchased for use in the Pacific, principally coasting in coal and lumber. Her registered tonnage was 1400 but she could carry 2300 long tons of heavy cargo. It may here be stated that after an active career of nearly thirty years she was laid up near San Francisco and in 1907 was finally broken up.

In March 1889 the J. B. Brown reached San Francisco with a cargo of coal from British Columbia under charter to return to Puget Sound to load lumber for Callao for the account of J. W. Grace & Co. On the run down the coast she had experienced severe weather and shipwrights were engaged in repairing her broken bulwarks when I chanced to see her at the Pacific Street coal wharf.

A year previously I had taken "French leave" from the British ship Sherwood to make coasting trips on American ships but had never been "deep water" in ships other than those flying the Red Ensign. I had heard voyages to the West Coast well spoken of and learning that Captain Cameron of the J. B. Brown had a good name on "the beach" I applied for and was given the opportunity of signing her articles as an A.B. There were eleven others and we were to receive $40 a month for stowing the lumber cargo at Tacoma. At sea the pay was $30 monthly, the regular scale for West Coast voyages at that period. In addition to the regular crew there was a young man who had never been to sea who was to work his way to Tacoma and then receive pay while helping stow cargo. We of the forecastle were favorably impressed with the liberal way in which this man was treated by Captain Cameron, who later proved to be in every way a credit to his profession and one of the best masters any of us had ever sailed under.

On April 4, 1889, we were towed out through the Golden Gate, and standing well offshore, made Cape Flattery on the eighth day out. Here we were picked up by the tug Tyee and towed to Hanson's Mill, Tacoma, old town.

As the charter carried a goodly number of lay days, our lading progressed slowly and we had quite an easy time. The city of Tacoma, then called New Tacoma, was building up rapidly, developing into a formidable rival of the older city of Seattle some twenty miles closer to the sea, and there was considerable feeling between the citizens of the two ports.

A Boat Race

Some two weeks after our arrival at the mill we learned that a great regatta was to be held at Tacoma, there being included in the program a race between boats of the ships then in port. Our Old Man entered one of our boats against those of the American ship Two Brothers, Captain McCartney, and the Nova Scotia ship Habitant, Captain Potter. In training to prepare for the race, our boat's crew of which I was one, pulled a distance of six miles every evening after work. On returning to the ship the boat was hoisted up, wiped dry, sand-papered and then black-leaded from keel to water-line. Having worked lumber during the day we were pretty well tired when turning-in time came.

The race duly came off, resulting in favor of the Two Brothers' boat; but our captain was convinced that his boat and crew were the better of the two and he offered to wager Captain McCartney $500 on the outcome of a longer race, but nothing came of this. A couple of years later we learned with regret that the latter gentleman had been drowned at Vladivostock while boat sailing. There was no ill feeling between the rival crews over the result of the race; in fact the winners invited our boat's crew ashore to help celebrate the event. Their prize money, $100, was spent principally in liquid refreshments, and a first-class, jolly time was had by all participants.

Towed Ashore

On June 4 our cargo was all on board and stowed in good shape; stores had been received, and early in the evening we left Tacoma in tow of the small tug Katy for Port Townsend, where the powerful ocean going tug Tyee was to hook on and take us to sea. During my trick at the wheel, about ten o'clock that night, I called the attention of our mate, Mr. Meehan, to the erratic way the Katy was steering. Repeated shouting to her failed to get any response and the first thing we knew we were ashore, while Katy was still afloat, pulling for all she was worth. The water was smooth, the weather hazy, at times quite thick. Our whole crew were soon on deck and finally by dint of continued lusty shouting we roused the Katy's captain, whose voice out of the darkness announced that his mate was in a drunken stupor at the wheel and that he would cast off and put back to Seattle for assistance.

The morning found us high and dry on a pebbly beach near Port Madison. We had gone ashore at extreme high water and could now walk all around the ship, which was well heeled over. The beach was smooth and the only danger to the ship seemed to be from possible straining; bad weather was not likely to come on at that season of the year.

Seattle Fire

During the afternoon of that day, June 5, we could see that there was a great conflagration in Seattle and it later developed that the whole city was wiped out, with the exception of the residence section on the high ground. Every business house, bank, hotel, mill, warehouse, steamboat wharf, coal bunker, and railroad depot was burned, and the total loss was stated at over fifteen million dollars. All the towboats were too busy

to come to our assistance and it was not until the third day after our stranding that three tugs appeared, the Richard Holyoke, Mastick, and Tyee. The Katy was not in evidence. All three tugs made fast to our ship and finally floated up at high water. They pulled our bitts out but apparently there was no other damage received in connection with our mishap, and the Tyee towed us to Port Townsend.

While Captain Cameron was ashore attending to his clearance a report was heard that a survey would have to be held on the Brown, which would mean incurring considerable delay and expense. Our crew had been looking forward to having a farewell night ashore; but when Captain Cameron told us that he could arrange to start to sea at midnight if we were agreeable, such was the high esteem we had for him, that as one man we said that we would do all we could to assist. A hurried trip ashore was made for necessities and at nightfall we hove short on the anchor. Just before midnight the Tyee came alongside, the hawser was made fast, and we were soon on our way to sea. The captain had sent two bottles of good liquor to the forecastle and we drank his health and that of his estimable wife and their ten-year-old son, who were also making the passage. The following afternoon we were dropped by the tug twelve miles outside of Cape Flattery, made all sail with a fine breeze from the north-west, and away we went.

The J. B. Brown proved to be a dull sailor nor did she show up very favorably as a sea boat in bad weather. According to what we heard of her record for speed she was only noteworthy as having made a passage nearly side by side with the ship Southern Cross from San Francisco to Liverpool in 1876. Both ships had passed through the Golden Gate in company; had later spoken each other on five different occasions, in two instances being together for a full week at a time; finally towing into the Mersey side by side, 117 days from San Francisco. This was considered remarkably even sailing and was a matter of considerable comment at the time, particularly as the Southern Cross had admittedly the better model for speed.

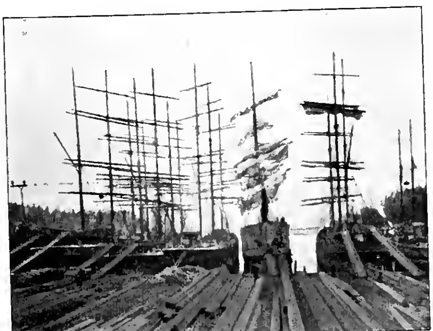
As to our passage to Callao, we jogged along, generally with fine weather but light winds. After running down the northeast trades we were two weeks in the doldrums. When a little south of the latitude of Valparaiso, the ship was hauled to the eastward and then stood up the coast, with cape pigeons following in our wake. San Lorenzo was finally sighted, and we reached our destination after a passage of 77 days from Port Townsend. It was an easy voyage. We had a good crew, four Norwegians, two Americans, and two each of English, Irish, and Germans; all thorough seamen. The best of treatment had been received from the ship's officers and none of us thought of leaving the ship. But as it later developed, fate had decided otherwise as to myself.

At Callao

The morning after our arrival found us at a fine dock ready to discharge. A British company owned three of these docks, each being equipped with hydraulic cranes every ship length. At the shore end were gates with two vigilantes always on duty, or what would be a more proper expression, asleep on duty. We found out cargo was to be discharged by hand and as each piece had to be measured, the work progressed very slowly. The second morning none of the shore gang showed up for work, it being Santa Rosa Day and we soon found that there were one or more holidays every week. This delay caused Captain Cameron to become rather irritable, but the crew never suffered thereby. The work was going on according to the custom of the port and there was no recourse.

During the morning of our second Sunday at Callao a gunboat arrived from Hamburg where she had been built for the Peruvian Government. She was a very small affair, mounting only four four-inch guns; but the enthusiasm of the populace amply made up for her deficiencies and every one was out celebrating the momentous event of her arrival. Most of our crew went ashore to see the sights, Captain Cameron having advanced us twenty sols (about ten dollars American), as liberty money. On emerging through the pier gates we found a long narrow street along the waterfront, paved with cobbles, very dirty and even filthy. Every other house was a saloon or cafe, many being notorious dives masquerading under such euphonious titles as the American Star, Liberty, United States Hotel, to lure the unwary. Dancing, singing, and fighting were kept up all night.

Myself and two others who had been companions during the day started back for the ship late in the afternoon. When about two hundred yards from our vessel, a gang of drunken soldiers came head on to us singing, shouting, and yelling, "Down with the Gringos," "Now we can lick the United States," and the like. Just as they came abreast of us a soldier spat in the face of Paddy, one of my pals. In a second, Paddy flew at him and grabbed his sword. We were at once surrounded by the drunken mob with drawn swords but the jam was so close that these could not be used. However I got a clip on the head and found myself on the ground, tramped on by bare feet. Managing to get up I helped my companions, we fighting with hands and feet the best we could. When the fracas started I happened to be cutting a quid of tobacco with my knife and now shouting to Paddy and Charley to make a dash for the ship, I started to clear a way out. A soldier making a lunge at me with his sword, I was just able to dodge clear and countering, caught him in the face with my knife. He let out a blood curdling yell and they all stopped as if shot. Taking advantage of the lull we three made a break for the ship, soon, however, followed by a mob of over two hundred half crazed Peruvians intent on murder. They not being fleet footed we got on board the Brown safely but with clothes torn to ribbons.



Sailing ships loading lumber at a Puget Sound mill about 1890.

Repelling Boarders

Our attackers, now reinforced by some hundred longshoremen, attempted to swarm up the gang plank; but those of our crew who were on board had heard the shouting and were armed to repel boarders. Captain Cameron had a revolver in each hand; our carpenter was leaping to and fro with a big broad axe; and a couple of seamen were swinging hand-spikes and belaying pins. These exhibits cooled the courage of the mob and most of them withdrew.

Fearing trouble on account of the cutting incident, it was decided best for me to go into hiding after the four-inch gash in my head had been treated and some clothes obtained. Taking some bread, meat, and water, with two candles, I went into the hold through the chain locker and by crawling and squeezing over the timber ends, managed to get into the wings midway between the fore and main masts. A couple of hours later I heard a great commotion on deck and later learned that it was the vigilantes taking Paddy and Charley to jail, with also an Englishman called Tom. The latter bore some resemblance to me, and the soldiers nearly killed him. Captain Cameron, however, succeeded in getting him released that night but he was badly injured and was sent to the hospital.

For five days I remained hidden in the hold, getting on deck each night a short spell for air. No sleep was possible below due to the presence of an army of rats attracted by my food supply, and my physical condition was becoming very bad. Through the continued discharge of the cargo it was now only a question of my soon being routed out of hiding, and it was evident that the vigilantes believed I was still on board. Therefore it seemed imperative that I must escape from the ship. While I was on deck the sixth night Captain Cameron advised me to decamp and if possible get to Chile. He paid me some $120 in American and Peruvian money, all I had coming except about $10, which the Consul had been told was all the ship owed me. It seems that the Consul, who was a Peruvian and in sympathy with his countrymen, had been aboard just after the trouble and had demanded my wages as part compensation for the injuries done the soldier.

Escape In Disguise

As I was crawling along the deck preparing for my get-away I met a German sailor from a Chilian bark. This man whom we called Louie had been a frequent visitor to our ship and had witnessed the Sunday fight. He at once interested himself in my behalf; had me shave off my moustache and blacken my face with burnt cork to the color of a mulatto. This being done, and wearing an old straw hat, I looked not unlike a Peruvian longshoreman. Bidding good-bye to Captain Cameron and the crew, Louie and I started to test the efficacy of my disguise.

The J. B. Brown's cargo was being discharged through the stern ports and three soldiers guarded the shore end of the gang plank. Louie had been on the coast some tweny years and spoke Spanish like a native. So, he talking loudly, we boldly went ashore and on approaching the guards, I started laughing heartily with interjections of "Si, si, Senor" at intervals. These tactics, with my "Buenos noches, Senors," to the vigilantes, completely allayed any suspicion, and with their response of "Buenos noches, Amigo," we were clear. Continuing at a slow pace, we proceeded until Louie hailed a boatman who took us to the farthest part of the city. I had slipped into his hands a five sols gold piece, so the boatman asked no questions.

Landing on the outskirts of the city, we made a long detour before getting into the residential district and finally arrived at the home of a friend of my escort, who was captain of the water boat. This man, a Swede, had been living in Callao twenty years and was married to a Peruvian lady. The couple knew all about the Sunday attack on the sailors of the J. B. Brown which they denounced as cowardly in the extreme and proffered all the assistance in their power. It was arranged that I was to stay with them until the steamer Ayacucho, south bound, arrived in port, when Louie was to put me on board. Five days later this was duly done. My kind friends refused to accept any pay, so I put a five sols piece for flowers for the little altar in their sitting room which pleased them very much. By Louie I sent a letter to Captain Cameron, thanking him for assistance in my hour of need and also soliciting the favor of his shipping Louie in my place. Louie wanted to get to the "States" to trace a brother whom he had not seen for twenty-five years.

Valparaiso

I was overjoyed when the Ayacucho got under way at 6 o'clock. Shortly after the chief officer asked if I was a passenger. On my reply that I was a sailor seeking to work my way to Iquique, he said "All right, go to the quartermaster's room." Next morning I was set to work splicing two eight-inch hawsers that are used in the various "outside" ports on the Coast.

At Iquique I found no ships except those bound for Europe, whereas I wanted to get back to the North Pacific Coast. Proceeding to Valparaiso the same state of affairs was found. On the following north bound trip of the Ayacucho, the kindly chief officer took me as a work-away to Panama. On this passage we put into every port on the coast including Callao but as I was still disguised in a way and was wearing a quartermaster's cap, I felt safe from detection. However the hours spent in port seemed an age. I learned that the J. B. Brown had left Callao for Caleta Buena to load nitrate for San Francisco with Louie as one of her crew.

Panama

When I arrived at Panama things were very quiet. The French had just abandoned work on the canal and were leaving the country in large numbers. An epidemic of yellow fever was prevailing. In a couple of weeks I ran across the boatswain of a cargo hulk belonging to the Pacific Steam Navigation Company who had fine roomy quarters aboard and a crew of about 150 peon longshoremen. I was put to work to assist him until an opportunity offered for me to get to San Francisco.

One night during a tropical thunder storm I was roused out by the freight clerk and boatswain who had found two natives loading a dug-out canoe with cargo from a lighter alongside of us. At the point of a gun the two thieves were brought on our deck and lashed to a stanchion, I being detailed to stand watch over them until morning. Somehow or other they managed to free themselves in an hour or so and the first thing I knew, they suddenly sprung on me as I was making the turn in front of them and knocked me flat on deck. Then making one spring in the dense darkness, over the side they went into the shark infested waters, free men so far as any pursuit from us was possible. The next morning the captain of the hulk looked at me very suspiciously but it was found that the prisoners had not been lashed sufficiently tight and had been able to wriggle hands and legs loose.

(Continued on Page 23, Blue Form)

Pacific Marine Review

Safety—The Management's Job

By Robert F. Hand,*
Vice-President, Standard Shipping Company.


Robert F. Hand

THE safety engineer tells us that there are two types of accident causes. The first, he says, accounting for between 15 per cent and 25 per cent of the personal injuries that occur, is the mechanical equipment which goes wrong or is improperly guarded. The second, which he says accounts for from 75 per cent to 85 per cent of the accidents, he calls the human factor. This human factor he again breaks down into such classifications as negligence and carelessness.

If you have had anything to do with seamen and the accidents that befall them, you will agree with the safety engineer. Indeed, you may add to his second figure and claim that about 90 per cent of the accidents on your ships are attributable to negligence or carelessness on the part of the injured or his fellow seamen. Some fellow goes down the ladder with a cup of coffee in one hand, a sandwich in the other; he trips, falls, and breaks a leg. You know he was careless not to keep one hand on the rail. Then your next accident report says an oiler injured his toes by allowing a floor plate to drop on his foot. Such accidents repeat themselves so often that at last you are firmly convinced that the present-day sailor will never learn to be careful, to be safe. You do all the things you are required to do as regards safeguarding the machinery; you even do a few extra things in this line, hoping to decrease personal injuries. But the rest—that 80 or 90 per cent of your accidents—you despair of eliminating so long as seamen are what they are.

And perhaps what I have just said explains why comparatively few shipping companies are actively engaged in safety work. This may explain why, during the recent Annual Congress of the National Safety Council here in the world's greatest seaport, just a few old stand-bys attended the Marine Section meetings. The others all felt that the careless, negligent sailor was a doomed soul who could not be helped.

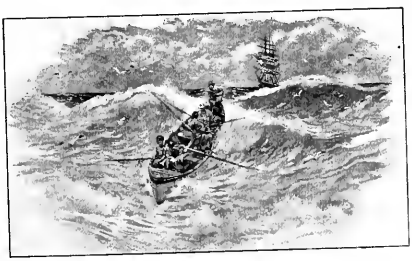
This attitude on the part of management is, let me use the same two words again, careless and negligent. The few ship operators who have engaged in safety work have found that they can reduce these accidents. They have listened to the stock arguments about the seaman being beyond the reach of safety help, about the tremendous labor turnover making safety work impractical for ships, about the conditions so vastly different from that in shore plants; and in spite of this, they have gone ahead, they have tried, and they have cut down their accidents.

Any management which does not know this is not on the job, just as much so as a seaman who does not know that to stand in the bight of a line is dangerous. Any management which knows that a safety program can produce good results and does not engage in one is negligent, just as is the boatswain who sends a man aloft in a boatswain's chair supported by rotten rope. And the management which engages in safety work in an indifferent way is as careless as the seaman who goes down a ladder with his two hands thrust deep into his pockets.

Not one of you here would care to go to a hospital where you knew the management was not interested in sanitation, where the doctors were noted for carelessness, and where the nurses were famed for neglecting their duties. Why should a seaman want to work for a company on whose ships he knows that only a gesture, or no effort at all, is being made to make his job as safe as possible and to make his fellow seamen careful workers? It's his life he's risking. But you cannot expect the individual seaman to originate the safety program any more than you can expect the patient to reform the hospital. This job is up to the management.

It is not my intention to outline a good safety program which could be adopted by those companies not engaged in such work already. The program which is best in our company might not be best in yours. The only point that I wish to bring out, that I wish to repeat and emphasize is that, granting carelessness and negligence to be at the root of the great majority of our accidents, management cannot expect the individual seaman to be a whit more safety-minded than it is itself.

There are something like 225,000 seamen required for the safe navigation of our American vessels. These fellows are on our ship this voyage, on yours the next, on another man's the next. If we are educating them to be safe workers, you gain by that; if you are neglecting to do so, when they come aboard one of our ships, they jeopardize the men already there and raise our compensation costs. The universal adoption on the part of operators of safety programs would assist in eradicating that serious factor of turnover as a hindrance to safety work. The man who was a seaman by profession would then receive constant safety education no matter how frequently he changed from ship to ship, from line to line. So, in a larger sense, as a group of managers, it seems to me that we are playing the part of the careless and negligent insofar as we fail to get together on this matter of promoting safety.



*Address before a recent meeting of the Propeller Club at New York.

Operating Economies of the All-Electric Ship

By Frank V. Smith,
Federal and Marine Department, General Electric Company.

THE fuel consumption of a steam vessel, whether it be propelled by turbine-electric drive, turbine-gear drive, or reciprocating engines, is the result of many correlated factors working together as an individual unit. The general and all-inclusive term "pounds of fuel per shaft horsepower hour for all purposes" therefore has little significance in a comparative sense unless the interplay of the factors producing it are correctly evaluated.

In the present article it is endeavored to look down the long pathway of causation and trace broadly the interplay of the many items which compose the whole and clarify if possible the subject of "comparative economic efficiencies of ships."

There are two major power problems to be dealt with in any ship installation. The first of these is that of power generation for the main propulsion of the ship; the second is that of power generation for the auxiliary power needs. The relation that these two power needs hold, one to the other, is specific for a given vessel only. Vessels in which these two power needs are not proportionate are obviously not comparable unless some fair means is found for reducing the over-all results to a common denominator.

Vessels which have similar characteristics but which differ in respect to the type of main propelling equipment installed are comparable only when the type of auxiliary equipment, the initial and final steam conditions, the boiler efficiency, and the heat value of the fuel are identically the same on the ships being compared. There are well-known thermo-dynamic differences which emanate from differences in pressure, superheat, vacuum, methods of heating the feed water, boiler design, and the heat value of the fuel which, although affecting the over-all efficiency of a ship, cannot be accredited to any particular virtue of the type of main propelling machinery installed.

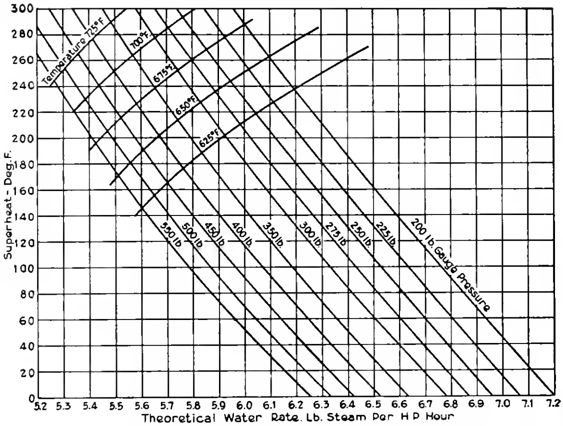
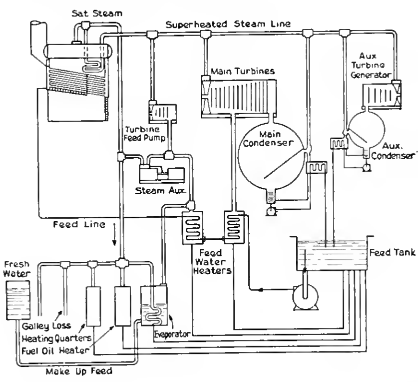


Chart No. 1. This chart gives the theoretical water rates for steam at various pressures and superheats expanded to 28.5 inches vacuum.



Diagrammatic layout of steam flow for turbo-electric propulsion.

For the purpose of segregating the mechanical efficiencies of the main propelling equipments from the thermo-dynamic differences referred to in the preceding paragraph, a complete analysis of a ship's engineering plant is given herewith. In the body of the analysis, results of which are shown on Tables I, II, and III, the work is divided into four columns in order to evaluate correctly the gains in economies resulting from the adoption of higher initial pressures and superheats. Layouts Nos. 1 and 2 are identical to the steamships California and Virginia respectively; layouts Nos. 3 and 4 are studies of the same installations operating at advanced steam conditions.

The main propelling equipment is of the turbine-electric type and consists of two main turbine generators, a control equipment for maneuvering the ship, and two propelling motors of the synchronous-induction type, each of which is directly connected to a propeller shaft. The auxiliary power plant consists of four 500-kilowatt, direct-current, turbine-driven generators which operate condensing. Two auxiliary condensers, each of which is equipped with its own circulating and

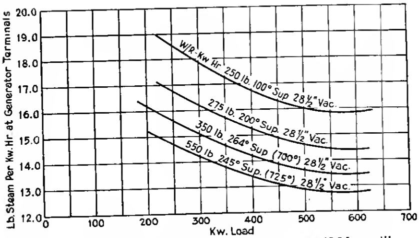


Chart No. 2 showing the water rates on the 500-K.V. auxiliary generating sets.

condensate pumps and air ejector, take care of the exhaust steam of the four sets.

Under operating conditions at sea two of these sets are required. One set supplies current for excitation and motor ventilation and the other current to the ship's power bus. A number of the electrically driven auxiliaries are provided with double-throw switches so they can be operated from either the excitation or power bus. This permits the loads on the generators to be divided about equally.

The feed water heating system consists of two feed water heaters of the closed type connected in series. The low pressure heater uses steam extracted from the main turbines at a pressure of approximately 2 pounds gauge and elevates the temperature of the feed water to about 195 degrees Fahrenheit. The second heater utilizes steam auxiliary exhaust, of which there is a sufficient amount to elevate the temperature from 195 degrees Fahrenheit to 230 degrees Fahrenheit—the final temperature of the feed water.

The water rates given under Layouts Nos. 1 and 2, Table I, are the results of actual test records with a small amount added to cover any slight throttling losses that might ensue in practice through the throttling of hand valves. Three hand valves are provided on the main turbines, giving seven different combinations of settings without throttling the steam pressure in the main turbine bowl.

The auxiliary power needs and steam consumption are shown in Table II and the totals are carried over to Table I. The fuel consumption figures are based on the pounds of steam generated, divided by the actual pounds of steam evaporated per pound of fuel at the conditions given on the table.

Table III gives data on the feed water heating system, the pounds of steam entering the main condensers per hour, and the calculations for the evaporation per pound of fuel oil. Under the subheading, "Explanation of Values Used in the Calculated Analysis," the method of evaluating the auxiliary power needs on a fair basis will be noted.

Space, of course, does not permit the inclusion of all of the interesting individual calculations leading up to an analysis of this kind, but it is hoped that from what is given the reader may get an idea of what constitutes a thermo-dynamic analysis. The calculation of a specific layout operating under variable power conditions is altogether too lengthy to include in an article of this kind, as it consists of another entire series of calculations.

Explanation of Values Used in Calculated Analysis

In the calculations it has been attempted to keep all values (except those which are directly affected by a change in the initial steam conditions) on a constant basis in order that the true economic differences caused by this factor may be correctly evaluated.

The power required by the main circulating pumps is calculated on the basis of 80 pounds of circulating water per pound of steam condensed, pumped against a total head of 26 feet with an 80 per cent efficient

BASIC CALCULATIONS SHOWING ECONOMIC DIFFERENCES DUE TO INITIAL STEAM CONDITIONS.

OPERATING CONDITIONS: Layout	#1	#2	#3	#4
Shaft Horse Power	17000	17000	17000	17000
Propeller R.P.M.	120	120	120	120
Speed Knots	18.0	18.0	18.0	18.0
Tons Displacement	32000	32000	32000	32000
STEAM CONDITIONS:				
Pressure at Turbine Throttle	250# G.	275# G.	350# G.	550# G.
Superheat " " "	100°F.	200°F.	264°F. (700°)	245°F. (725°)
Vacuum In.Hg. Ref. 30" Bar	28.5	28.5	28.5	28.5
Theoretical Water Rate	6.525	6.02	5.57	5.27
WATER RATES: Actual				
Main Turbines: Without Extraction or Admission Lb. Per Propeller S.H.P.-Hr.	9.05	8.14	7.48	7.15
Auxiliary Turbine D-C Generators, 500 KW- Lb. K.W. Hr.	16.0	14.6	13.5	12.8
STEAM CONSUMPTION:	Lb.-Hr.	Lb.-Hr.	Lb.-Hr.	Lb.-Hr.
Main Turbines, Without Extraction or Admission	153 850	138 380	127 160	121 550
Admit at Main Turbine Throttle in Lieu of Extraction	7 800	6 500	5 350	4 075
Total to Main Turbines	161 650	144 880	132 510	125 625
Auxiliary D-C Turbine Gen.	12 370	11 050	10 100	9 550
Steam Auxiliaries	7 700	7 015	6 950	8 665
Steam for Other Purposes	1 880	1 835	1 790	1 750
Total Steam Consumption	183 600	164 780	151 350	145 590
Lb. Steam S.H.P.-Hr. All Purposes	10.8	9.70	8.9	8.55
FUEL CONSUMPTION: Based on Fuel Oil of 18500 B.T.U. Per Lb. Feed Water Temp. of 230°F., and a Boiler Efficiency of 82.0%				
Actual Evaporation Per Lb. of Fuel Oil - Above Basis	14.18	13.46	13.02	12.98
Lb. of Fuel Oil per Hour	12950	12250	11625	11200
Lb. Fuel Oil per S.H.P.-Hr. All Purposes	.762	.720	.683	.66
Tons Fuel Oil Per Day	139	131.0	124.5	120
Knots per Ton of Fuel Oil	3.1	3.29	3.47	3.60
B.T.U. per S.H.P.	14100	13300	12625	12200
Overall Thermal Efficiency	18.05%	19.15%	20.1%	20.8%

Table I. An analysis of steam and fuel consumption.

BASIC CALCULATIONS FOR STUDY OF ECONOMIC DIFFERENCES DUE TO CHANGING DESIGNED INITIAL STEAM CONDITIONS

LAYOUT	#1	#2	#3	#4
ELECTRIC AUXILIARY LOAD	K-w.	K-w.	K-w.	K-w.
Excitation and Motor Ventilation	185.0	185.0	185.0	185.0
Main Circulating Pumps	154.0	139.0	128.0	124.0
Forced Draft Blowers	25.0	23.5	22.7	22.0
Other Auxiliary Equipment Including Auxiliary-condenser, Circulating and Condensate Pumps, Main Condensate, Sanitary Pumps, Fresh Water Pumps, Lighting, Electric Cooking and Baking, Ships Ventilation Refrigeration, Steering Gear, Oil Cooler Circulating Pump, Elevators and etc. Average est. load	355.0	355.0	355.0	355.0
Total Average Load	719.0	702.5	690.7	686.0
W/R.-Aux. Gen's. (2 Units Operating-divided load)	17.2	15.7	14.6	13.9
Lb. Steam Per Hour	12370	11050	10100	9550
STEAM AUXILIARIES:	Lb.-Hr.	Lb.-Hr.	Lb.-Hr.	Lb.-Hr.
Feed Pump; Turbine Driven Centrif.	4600	4050	4100	5900
Air Ejectors Main and Aux. Cond's.	1750	1615	1500	1415
Lubricating Oil Pump Recip.	750	750	750	750
Fuel Oil Service and Transfer Pumps	600	600	600	600
Total - Lb. Hour	7700	7015	6950	8665
STEAM FOR OTHER PURPOSES:				
Steam for Heating Fuel Oil	880	835	790	750
Steam for Galley & Hot W. Service	1000	1000	1000	1000
Steam for Heating Vessel		Seasonal		
Total Lb. Hr.	1880	1835	1790	1750

Table II. An analysis of auxiliary power requirements.

pump, and a motor of 92 per cent efficiency. The feed pump is assumed to be of the turbine-driven centrifugal type, pumping against a head 25 pounds in excess of boiler pressure and having an efficiency of 50 per cent. The steam consumption of the turbine which drives the feed pumps is based on a single-stage turbine turning at 3000 revolutions per minute and exhausting against a back pressure of 10 pounds gauge pressure.

The power for the forced draft blowers assumes that 260 cubic feet of air per pound of fuel burned is used, that the pressure at the fan outlet is 1½ inches of water, and that the fan efficiency is 45 per cent.

It is assumed that the steam consumption of the air ejectors is reduced proportionately to the amount of available energy in the steam at the higher pressures and superheats.

The steam for heating the fuel oil is based on elevating the temperature from 70 to 210 degrees Fahrenheit and an oil having a "specific heat" value of 0.45.

In the feed water temperature calculations it was assumed that the temperature of the condensate in the hotwell of the condensers was four degrees less than the vacuum temperature corresponding to 28.5 inches of vacuum. A loss of 5 B.T.U. per pound of condensate was also assumed as being fair to compensate for any radiation losses that might exist in the feed water heating system.

The pounds of steam extracted from the main turbines for feed water heating, its heat value, and the pounds of steam necessary to admit at the main throttle in lieu thereof to keep the power output constant were carefully calculated by means of condition curves laid out on a total heat entropy diagram.

Chart No. 2 shows the water rates on the 500K-v. auxiliary generator sets. In the calculations it has been assumed that two of these generators divide the load. The steam consumption has been figured on the water rates applying at the partial loads under consideration.

In the entire calculations a distinct effort has been made to keep the calculations within the bounds of normally obtainable values in actual practice. Layout No. 1 is similar to the installation on the steamship California and, from data previously published, it may be noted that the values check almost exactly. Layout No. 2 is similar to the installation on the steamship Virginia and fuel rates better than the calculated values have already been established. Layouts Nos. 3 and 4 are studies of the economies in the higher pressure and temperature regions.

Rankine Cycle and Transmission Efficiency.

In making comparisons between the actual over-all efficiencies of turbine-electric and turbine-gear drive, the evaluations must be made under identical steam, vacuum, and load conditions, otherwise thermodynamic differences which affect the mechanical efficiency creep in, which in turn offset the true relative values.

Superheated steam increases the mechanical efficiency approximately one per cent for each 50 degrees because of the reduction in the rotational losses; an increase in pressure and vacuum have a tendency to reduce slightly the mechanical efficiency, and high powered turbines are inherently more efficient than low powered ones.

Providing the equipments being analyzed are of the same power and operate under the same steam conditions, the "over-all efficiency on the Rankine cycle" is the only criterion of relative values. It is comprehensive in its scope and includes both the turbine and transmission efficiency when the value is calculated for the power delivered at the propeller shaft.

The transmission efficiency, on the other hand, does not include the turbine efficiency, as it only designates the efficiency between the turbine shaft and propeller shaft. A very inefficient turbine might be connected to a highly efficient gear, might show a transmission efficiency of 98½ per cent, and yet have a very low over-all Rankine cycle efficiency.

The answer to the question of relative efficiencies of turbine-gear drive and turbine-electric drive therefore resolves itself to a matter of comparing the over-all Rankine cycle efficiencies under identical steam, vacuum, and load conditions. There is no other method by which comparisons can rightfully be made. To use fuel consumption as a criterion of the specific relative efficiency of any given type of propelling equipment is utter nonsense when the hundred and one variable factors interceding between the main power plant and fuel pile are considered.

The contention of the advocates of turbine-electric drive are simply this:—that the main turbine, being built in one casing, operating in one direction, having no reversing element, having the minimum number of shaft packings, and having no cross over connection losses, has less inherent losses than a turbine built in several casings as a compromise measure to accommodate the gears.

Another factor that favors a high efficiency in a turbine-electric plant is that the speed of the turbine can be independently selected. In turbine-gear installations (of the single reduction type) the turbine speeds are relatively low. Small power and low speed are two factors that ruin the efficiency of any turbine, as all designers know.

A turbine-electric drive is more efficient on the driving end, less efficient on the transmission end; and turbine gear drive is less efficient on the driving end and more efficient on the transmission end. The product of the two values is the only answer to this much discussed subject.

Now how may the over-all Rankine cycle be checked? Two factors are required: the theoretical water rate, which is the pounds of steam theoretically required to produce one horsepower hour; and the actual water rate stated in terms of pounds of steam per propeller shaft horsepower hour. The theoretical water rate divided by the actual water rate gives the Rankine cycle efficiency. In order to simplify the work Chart No. I has been prepared which gives the theoretical water rates for steam at various pressures and superheats expanded to 28.5 inches of vacuum. The curves are based on the well known formula $\frac{2545}{H_1 - H_2}$, in which H_1 = the total heat of the steam at initial pressure, and H_2 = the total heat of the steam at the end of expansion.

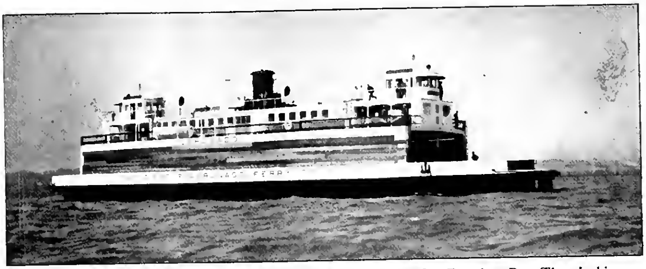
In an electric drive installation the actual water rates are generally given in terms of pounds of steam per propeller shaft horsepower hour, including the generator and motor losses, but exclusive of current used for excitation and motor ventilation. The reason for not including this latter item is because, in ship installations, it is supplied from an outside source and its relative value will therefore vary according to the water rate of the auxiliary generator which supplies it.

(Continued on Page 23, Blue Form)

New Auto Ferry Coronado

The Moore Dry Dock Co. Delivers to the San Diego-Coronado Ferry Co., New Atlas-Westinghouse Diesel-Electric Propelled Double-End Auto Ferry

AFTER completing exhaustive and successful trials on San Francisco Bay, the new diesel-electric automobile ferryboat Coronado, built by The Moore Dry Dock Company, proceeded to San Diego under her own power and was delivered on Monday, the 15th of April, to the San Diego-Coronado Ferry Company. She is now operating satisfactorily on her regular run between San Diego and Coronado across San Diego Bay.



The new auto ferry Coronado is shown here on her trial run in San Francisco Bay. The planking on the sides is temporarily installed for her long ocean trip to San Diego.

The principal characteristics of this vessel are:

Length over-all	190′0″
Molded beam	45′6″
Beam over guards	60′0″
Depth molded	14′9″
Engine power, total h.p.	1000
Speed on trials, knots	11.8
Capacity of ordinary passenger cars	55

As will be noted from the picture reproduced herewith, the Coronado is a very neat, trim craft; and her machinery arrangements and auxiliary equipment are complete and up-to-date in every respect. Power for propulsion and auxiliary machinery is provided by two 500-horsepower Atlas-Imperial, 8-cylinder, non-reversible, full diesel engines, each of which is directly connected to a 325-kilowatt Westinghouse direct-current generator. Electric power from these generators is supplied to two Westinghouse, 750-horsepower, direct-current motors, one driving the forward propeller and the other the after propeller. The operation of these motors is controlled on the Ward-Leonard system, with the speed adjustment at the engine room switchboard or in either pilot house as may be desired.

The engine room auxiliaries consist of a motor-driven Rix-Gardner compressor providing starting air for the main engines; a Sharples motor-driven centrifuge for purifying the lubricating oil; Byron-Jackson motor-driven pumps for fire, bilge, and general service; and an emergency generating set located on the upper deck in the engine room casing. This emergency generating set consists of a 4-cylinder Continental gasoline engine driving a Westinghouse direct-current generator and is of sufficient capacity to provide lights for the vessel and power for driving the starting air compressor.

Each pilot house is supplied with a Lietz compass, Cory engine room telegraph, Cory running lights switchboard, and a small searchlight on the deck above the pilot house with hand control inside.

The double steering gear was provided by Allan Cunningham of Seattle. It is electrically operated with direct electrical control from the pilot house and the well known Allan Cunningham electrical telltale helm angle indicator. Allan Cunningham hand gear is provided for emergency steering. Allan Cunningham also supplied the pneumatic whistles. At the control stand in the engine room there is installed a Bristol electric pyrometer indicator, with connections to pyrometers in each cylinder of each engine, so that the engineer in charge can at will have a temperature reading at any moment from any cylinder.

For convenience in possible adjustments and repairs, there is installed over each engine a heavy rail on which a Triblox chain tackle travels. This chain tackle was furnished by the Ford Chain Block Company. Engines are equipped with Madison-Kipp lubricators, and the propulsion motors are equipped with Kingsbury thrust bearings.

The propeller shafts are fitted with Goodrich Cuttless Rubber bearings at their outboard ends.

In short, this ferryboat power plant is complete in every particular. The all-steel hull of the craft is a very neat job of ship fitting. Below the main deck the hull is divided into five water-tight compartments. The forward and after compartments house the steering gear, then come two compartments housing the motors, the central compartment being the engine room.

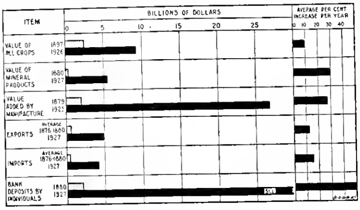
A very graceful superstructure effect is achieved by the open arch construction of the sides between main and upper decks. The upper deck carries a very nicely fitted up cabin for the accommodation of passengers, with ample seating arrangements, rest rooms for men and women, and out-of-door space at each end. The enclosed portion of this deck is covered with linoleum, and the main deck in way of automobile transportation is laid in Oregon fine decking.

The Coronado was built and equipped under the supervision of Cordes Brothers of San Francisco.

A Notable Statistical Jubilee

Division of Statistical Research, United States Department of Commerce, Erects a Fifty-Year Monument

THE Division of Statistical Research of the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce is the full title of a very useful agent of the federal government operating with quiet, efficient precision to the great benefit of all citizens who have use for accurate commercial data. One of the chief functions of this division is to compile that remarkable book, "The Statistical Abstract of the United States."



Certain phases of United States economic progress

A graphical representation of the progress made in the value of certain factors in the economic life of the United States during the past fifty years. Note that the increase in bank deposits by individuals is broken off at the right hand edge and should have almost double the length as indicated by the figures inset on the line.

This year the personnel of the Statistical Division point with justifiable pride to a fifty-volume shelf of annual issues faithfully portraying the economic progress of the nation and the development of the education, culture, and well being of the people.

Begun in 1878 under the Department of the Treasury, the task of preparing this book was transferred to Commerce and Labor in 1903, and in 1913 on the division of the latter department it fell to the Commerce branch.

What a story is compressed between these 100 buff paper covers. All the progress of engineering and science in the design and introduction of transportation facilities, labor saving devices, communication, and illumination is here displayed in figures that speak of abundant virility.

In 1878 there were fifty million people within the confines of the Union, with 300,000 telephones, with no automobiles and no electric lighting for homes, with so little electric energy produced by public utility plants that it is registered as none, with no electric vacuum cleaners, no washing machines, street cars, electric irons, radios, or refrigerators.

Today there are one hundred and twenty million people, with 18,000,000 telephones, 25,000,000 automobiles, 5,000,000 electric washers, 8,000,000 vacuum cleaners, 13,000,000 radio sets, nearly 2,000,000 electric refrigerators, and a yearly production of well over eighty billion kilowatt hours of electrical energy.

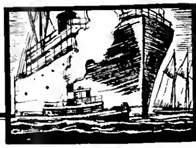
The gist of all these statistics is contained in the two illustrations herewith, one in tabular, the other in diagramatic form. Let us study them carefully and consider our responsibility. If our fathers built so marvelously on the foundation of 1878, we and our sons should certainly build gloriously on this so much more splendid foundation of 1928.

May the Division of Statistical Research long continue to observe and record such progress.

Item	Beginning of period: Year or yearly average	Beginning of period: Amount	End of period: Year	End of period: Amount	Number times multiplied	Number years	Average per cent increase per year
Population ... number	1880	50, 262, 000	1928	120, 013, 000	2. 39	48	2. 89
Agriculture:							
Values all crops ... dollars	1897	2,519,000,000	1926	9, 266, 000, 000	3. 68	29	9. 24
Corn ... do	1876–1885	617, 780, 000	1927	2, 015, 000, 000	3. 26	46	4. 92
Wheat ... do	1876–1885	391, 104, 000	1927	974, 694, 000	2. 49	46	3. 24
Cotton ... do	1876–1885	243, 808, 000	1927	1, 254, 000, 000	5. 14	46	9. 01
Value per acre, 10 leading crops ... do	1876–1880	11. 89	1927	20. 89	1. 76	49	1. 51
Mining:							
All mineral product ... do	1880	367, 000, 000	1927	5, 520, 000, 000	15. 04	47	29. 87
Coal production ... short tons	1876–1880	62, 261, 000	1927	600, 456, 000	9. 64	49	17. 64
Petroleum production ... barrels	1876–1880	16, 816, 000	1927	894, 435, 000	53. 18	49	106. 51
Steel ingots and castings production ... long tons	1876–1880	803, 000	1927	44, 935, 000	55. 96	49	112. 16
Copper production (smelter, output from domestic ores) ... pounds	1876–1880	50, 000, 000	1927	1, 684, 000, 000	33. 68	49	66. 69
Manufacturing:							
Value of products ... dollars	1879	5,370,000,000	1925	62, 714, 000, 000	11. 68	46	23. 21
Value added by manufacture ... do	1879	1,973,000,000	1925	26, 778, 000, 000	13. 57	46	27. 33
Wage earners ... number	1879	2, 733, 000	1925	8, 384, 000	3. 07	46	4. 49
Installed horsepower ... horsepower	1879	3, 411, 000	1925	35, 773, 000	10. 49	46	20. 63
Foreign trade:							
Value of exports ... dollars	1876–1880	676, 761, 000	1927	4, 865, 000, 000	7. 19	49	12. 63
Agriculture products ... do	1877–1881	591, 351, 000	1927	1, 908, 000, 000	3. 23	48	4. 64
Finished manufactures ... do	1876–1880	98, 719, 000	1927	1, 982, 000, 000	20. 08	49	38. 93
Value of imports ... do	1876–1880	492, 570, 000	1927	4 185, 000, 000	8. 50	49	15. 30
Agriculture products ... do	1877–1881	266, 384, 000	1927	1, 906, 000, 000	7. 16	48	12. 82
Finished manufactures ... do	1876–1880	144, 573, 000	1927	878, 597, 000	6. 08	49	10. 36
Finance:							
Individual deposits in banks, including outlying territories and possessions ... dollars	1880	2,134,000,000	1927	51, 133, 000, 000	23. 96	47	48. 83
Wealth ... do	1880	43,642,000,000	1922	320,804,000,000	7. 35	42	15. 12
Per capita ... do	1880	870	1922	2, 918	3. 35	42	5. 63
Education:							
Public school enrollment ... number	1880	9, 868, 000	1926	24, 741, 000	2. 51	46	3. 28
College and university enrollment ... do	1890	122, 000	1926	767, 000	6. 29	36	14. 69
Some new things:							
Telephones in use ... do	1895	310, 000	1927	18, 365, 000	------	------	------
Automobile registrations ... do	1878	None.	1927	23, 127, 000	------	------	------
Electric washers in use ... do	1878	None.	1927	[1] 5, 571, 000	------	------	------
Electric vacuum cleaners in use ... do	1878	None.	1927	[1] 8, 218, 000	------	------	------
Electrical energy produced by public utility plants ... kilowatt-hours	1878	None.	1927	80, 205, 000, 000	------	------	------

[1] Number sold within last 10 years.

Tabular statement showing the growth in economic factors and living conditions in the United States during the past fifty years.



Trade, Traffic, and Shipping

Ocean Shipping of Fresh Fruits

Some Notes on the Growth and Possibilities of Refrigerated Fresh Fruit Shipping on the Pacific Coast

THE three Pacific Coast states, Oregon, Washington, and California, have a tremendous capacity for the raising of perishable fruits and vegetables and the manufacture of semi-perishable food products. These three states, on the other hand, have a comparatively small though growing capacity for the consumption of these products. These opposing conditions create an enormous transportation problem, the solution of which has been troubling the minds of experts for many years.

In 1923 the serious situation of terminal congestion and shortage of facilities for land and sea transportation facing the producers of perishable products on the Pacific Coast was noted by the Agricultural Legislative Committee of California. This committee, representing 35 farm organizations, requested Herbert Hoover, then Secretary of Commerce, to undertake a study of the entire problem of transportation of western perishables both for domestic and foreign markets. This study or survey was directed by the Department of Commerce experts along broad economic lines with the object of determining and removing the causes of large wastes in the transportation and distribution of perishable products.

In 1924 the Department of Commerce published the results of this study. A section of the report is devoted to Ocean Transportation Problems. This section was and is very illuminating. A study of its recommendations and conclusions is suggested for the benefit of producers and shippers of California fresh fruits and vegetables.

Exports of fresh fruits from the United States

[In units of thousands]

Year	Apples in boxes			Apples in barrels			Oranges		
	Boxes	Value	Average price	Barrels	Value	Average price	Boxes	Value	Average price
1928	8,149	$17,431.00	$2.14	1,829	$9,232.00	$5.00	2,678	$13,912.00	$5.20
1927	6,407	15,000.00	2.34	3,042	15,200.00	5.00	3,600	15,000.00	4.17
1926	6,924	15,400.00	2.23	3,082	15,000.00	4.87	2,700	11,400.00	4.22
1925	4,922	12,800.00	2.61	1,707	8,275.00	4.87	2,000	9,850.00	4.92

Year	Pears			Orapefruit			Grapes		
	Boxes	Value	Average price	Boxes	Value	Average price	Kegs	Value	Average price
1928	1,453	$4,143.00	$2.85	679	$2,904.00	$4.28	1,141	$2,505.00	$2.19
1927	1,134	3,800.00	3.37	765	3,300.00	4.34	824	1,979.00	2.40
1926	1,375	3,600.00	2.63	411	1,773.00	4.32	631	1,536.00	2.43
1925	1,434	4,100.00	2.87	447	1,500.00	3.41	516	1,429.00	2.77

Year	Lemons			Berries			Peaches		
	Boxes	Value	Average price	Pounds	Value	Average price	Bushels	Value	Average price
1928	251	$1,430.00	$5.70	14,240	$1,434.00	$0.10	462	$730.00	$1.58
1927	308	1,500.00	5.00	11,100	1,100.00	.10	370	777.00	2.10
1926	296	1,285.00	4.43	8,800	900.00	.10	301	523.00	1.74
1925	162	900.00	5.62	8,100	960.00	.12	338	734.00	2.16

Source: Figures for 1925 to 1927 from Commerce and Navigation of the United States, published by the Department of Commerce. Figures for 1928 are preliminary.

Among other things, we note:

"The fresh fruit and vegetable industry is practically unorganized so far as export trade is concerned."

"Development of water transportation for Pacific Coast perishables appears to be a promising solution of the problem of extending markets. The largest fruit producing sections of the Pacific Coast are within relatively short hauls of the ports. The domestic markets . . . . are principally along the Atlantic Coast. The principal potential foreign markets lie along the coasts of the Orient, Central America, and Europe."

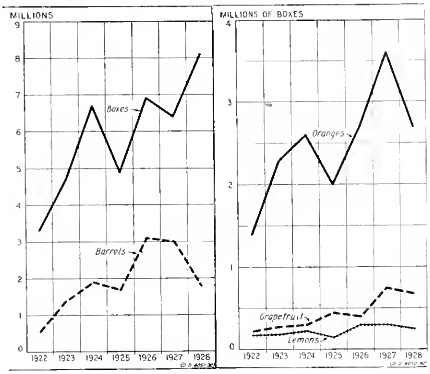
The statement is made that the California State Department of Agriculture estimates that the saving on freight charges is approximately 31 per cent for water refrigerative transportation as compared to rail refrigerative transportation to the Atlantic Coast ports. This would amount to approximately $12 a ton. The saving in direct water shipment to Europe as compared with rail to Atlantic Coast and shipment thence by water would probably be greater than that for the intercoastal run.

Many difficulties are listed: "Lack of precooling plants at Pacific Coast ports; Lack of properly equipped refrigerative ships; Lack of refrigerated storage at ports of destination (particularly on the Atlantic Coast of the United States); Lack of refrigerated return cargoes; Lack of organization among shippers; Lack of real information as to best methods of refrigeration and ventilation when passing through the tropics."

To date a rather slow progress has been made in refrigerative shipping of Pacific Coast perishables in the intercoastal trade. In the direct refrigerative trade to western Europe, however, there has been a remarkable growth which is still gaining.

The reason for slow growth in refrigerative intercoastal shipping is found in the limitations of return cargo and the lack of proper cold storage terminals at Atlantic ports. On new vessels, particularly the fast passenger and freight liners of the Panama Pacific Line, there has been a tendency to increase the refrigerative space installed on each addition to the fleet.

In the western Europe direct refrigerative trade, rapid expansion is in evidence and it is very apparent from the figures that much perishable freight formerly moving by rail to New York and thence transatlantic is now going direct by water. In 1919 the Panama Canal carried no Pacific Coast apples bound for Europe, and nearly 2,000,000 boxes that year went by the rail and water route. In 1928 about 2,500,000 boxes



Graphs showing fluctuation in United States exports of boxed and barreled apples and citrus fruits.

went by each route. The steamship operators estimate that 4,500,000 boxes will go via Panama Canal in 1929.

In 1920 there were four direct lines of steamship services operating between Pacific Coast and Europe. Today there are fifteen lines employing 102 vessels via the Canal from the Pacific Coast ports to ports of United Kingdom, Scandinavia, Germany, Holland, Belgium, France, Spain, and Italy. Fifty-four of these vessels are equipped with refrigerative facilities. Their total capacity at one sailing is 167,000 tons. The agents of the lines operating these steamers are building up the refrigerative business, using apples and pear shipments from the Northwest as a foundation to provide volume, and filling in with increasing amounts of California fresh fruits and general perishable cargo from all Pacific Coast ports.

Fresh Fruit Exports In 1928

In Commerce Reports for April 1, 1929, an article appeared on "United States Fresh Fruit Exports in 1928." This was illustrated with graphs and tables, a number of which are reproduced here. From the standpoint of the ship operator, this article is interesting because by a slight use of arithmetic he can reduce the figures in the tables to cargo tons and by some analysis of the text arrive at an approximation of just what tonnage is persistently available as profitable cargoes from Pacific Coast ports.

Apples will run approximately 40 boxes to the short

EXPORTS OF PERISHABLES FROM SAN FRANCISCO

Commodity	Unit	1925	1926	1927
Grapefruit	boxes	8,641	10,399	18,394
Lemons	"	47,628	58,309	72,208
Oranges	"	91,166	113,577	121,770
Pineapple	"	-	21	2
Other subtropical fruits	lbs	8,991	-	-
Apples in boxes	boxes	145,967	251,475	345,831
Apples in barrels	bbls.	1,512	5	-
Berries	lbs.	174	1,070	2,651
Grapes	"	1,291,425	1,654,803	2,670,305
Pears	"	116,415	307,865	594,576
Peaches	"	13,425	40,886	34,460
Other fresh fruits	"	93,094	86,016	148,047
Potatoes	bu.	49,243	55,578	39,606
Onions	"	75,673	101,968	47,677
Other fresh vegetables	lbs.	1,366,828	1,266,448	1,140,221
Fresh beef and veal	"	1,987	6,576	4,481
Porkloins and other fresh pork	"	55,180	32,567	22,360
Mutton and lamb	"	407	1,300	400
Fresh Poultry and Game	"	15,077	11,892	9,920
Eggs.	doz.	92,068	3,080	5,060
Fresh and sterlized milk and cream -	gal.	408	1,840	184
Butter	lbs.	840,197	1,030,817	819,899
Cheese	"	258,833	241,954	191,757
Fresh Salmon	"	76,532	12,160	58,162
Other fresh fish	"	13,323	2,729	24,208
Shell fish	"	744,354	762,778	916,460
Lard & substitutes	"	1,953,645	2,560,935	2,095,342

Exports of boxed apples from United States

[In thousands of boxes]

Country of destination	1926	1927	1928	Country of destination	1926	1927	1928
United Kingdom	3,350	3,088	3,536	Norway	90	115	61
Germany	855	1,038	1,575	China	56	25	51
Netherlands	581	219	849	Hong Kong	49	34	44
Canada	695	581	646	Finland	36	40	43
Argentina	169	229	265	Egypt	46	66	42
Brazil	189	119	200	British Malaya	22	25	28
Sweden	211	209	185	France	4	2	25
Denmark	98	209	137	Panama	25	23	21
Philippines	106	105	113	Other countries	149	129	160
Mexico	108	78	106				
Cuba	85	73	62	Total	6,924	6,407	8,149

Source: Figures for 1926 and 1927 from Foreign Commerce and Navigation of the United States, published by the Department of Commerce. Figures for 1928 are preliminary.

ton, or in round numbers 200,000 tons for the 8,000,000 boxes. Practically all of this boxed apple trade is Pacific Coast and practically all of this 200,000 tons of export is available for water shipment as shown in the distribution table herewith. The barreled apple exports are practically all Atlantic Coast trade, mainly from New York and Virginia.

Oranges show 67,000 tons exported in 1928. Over 57,000 tons of this total goes to Canada, leaving less than 10,000 tons for overseas export, a considerable portion of which comes from Florida and Porto Rico. Oranges and other Pacific Coast citrus fruits are not very favorably situated for competing in the European markets, with equal quality fruits raised at less cost and transported at less expense.

Lemons exported in 1928 totaled 6250 tons, 4600 tons going to Canada and the balance of 1600 tons going in scattered shipments chiefly transpacific, Japan and New Zealand each taking 350 tons, China 300 tons, Philippines 170 tons, and Australia 88 tons.

Grape Fruit exports from Pacific Coast are in very small quantity, and practically negligible so far as making up ship cargoes are concerned.

Pears are at present next in importance to apples as producing cargoes for Pacific Coast export services. 36,200 tons of pears were exported in 1928, of which Canada took 15,000 tons, leaving 21,000 for overseas shipping. The bulk of this is Pacific Coast and is shipped through Seattle, Portland, and San Francisco. Almost entirely to Europe and South America. The United Kingdom took about 14,000 tons, Germany, Netherlands, and Sweden 900 tons total, Brazil 2700 tons, Argentina 1300 tons, and Cuba 800 tons.

Grapes are a California specialty. The United States exported nearly 27,000 tons of grapes in 1928. Canada and other adjacent markets took 20,000 tons, leaving 7000 tons for overseas shipping. This is distributed all over the world in small scattered lots.

Berries yielded a total export of 7100 tons. Canada took 6400 leaving 700 tons for overseas, 650 tons of which went to United Kingdom.

Peaches. Of 11,000 tons exported, 9900 went to Canada, leaving 1100 tons for scattered shipments to the rest of the world.

Other fresh fruits. Under this head are included plums, prunes, melons, cherries, apricots. The total exports under this head figures about 30,000 tons. Of this total 25,500 tons went to Canada, leaving 4500 tons for scattered world shipments.

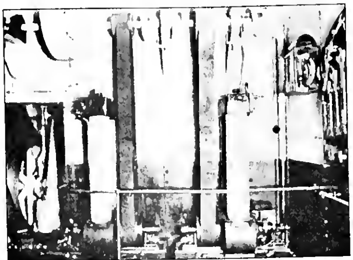
Summing up the fresh fruit export tonnage available for ship cargoes from the Pacific Coast, on a basis of 1928, we have in round numbers 200,000 tons of apples and 45,000 tons of other fresh fruits. By no means all

(Continued on Page 23, Blue Form)

Light's Golden Jubilee

Fiftieth Anniversary of Edison's Incandescent Lamp

THE year nineteen twenty-nine marks the fiftieth anniversary of the introduction of the practical incandescent lamp by Thomas Alva Edison, and the Edison Pioneers on the occasion of the 82nd birthday of the Wizard of Menlo Park initiated a movement for a great world-wide celebration to take place during 1929 and to be known as Light's Golden Jubilee. A sponsoring committee is now being selected and the exact dates arranged for this celebration, which will no doubt feature the many and wonderful advances in the application of electricity along many lines and will be an occasion for much serious retrospection, profound appreciation, and genuine inspiration.



The dynamo room of the Oregon Railway and Navigation Company's steamer Columbia. This plant furnished the power for the first commercial installation of Edison lamps, started on the night of the 7th of May, 1880, on the maiden voyage of this vessel bound from New York round the Horn to Portland, Oregon.

In this connection, it is well that marine engineers and ship operators remember the first commercial installation of the then new Edison dynamos, Edison parallel circuit, and Edison incandescent lamps was aboard ship and was operated by a marine engineer. This installation was placed on board the steamship Columbia, built by John Roach in Chester, Pennsylvania, in 1879 for the Oregon Railway and Navigation Company. The history of this plant is best told in the following interesting letter from the engineer of the company under date of February 24, 1882, and published in the fourth bulletin of the Edison Electric Light Company. It follows:

"In 1879, while the Columbia, which contains a large number of passenger rooms, was under construction, President Villard conceived the idea of lighting each room in the vessel independently by the electric light. Thereupon, at your suggestion and by his orders, I wired the ship with No. 11 wire for mains and No. 32 wire for loops, insulated by double cotton paraffine and painted over all. The wires were run throughout the entire vessel, but the project at that time being experimental, we lighted only the passenger rooms and main salons. The dynamos, of which we had four, one of them running at half the speed of the others as an exciter or fielder, were of the class you now call 'A' and were all run from a countershaft directly overhead, driven in turn by a pair of vertical engines at a very high angle in order to economize freight space. On the night of the 2nd of May, 1880, we started up the dynamos, and from the time when the steam was first turned on until the present day they have worked to our entire satisfaction under all circumstances.

We found the light of the greatest value for the examination of the ship's propeller, rudder, or hull, which examination we conducted by connecting to a main line aft, or at any convenient point, a coil of insulated wire with lamps attached to a sinker.

The first lamps used, being of the paper carbon variety, were irregular in their duration of life and so liable to breakage by heavy shocks that I found it best to suspend them from the wires above, and to do away with the sockets entirely. The lamps being surrounded with a ground globe, the attachment was hid, the lights being suspended from the ceiling. Since the arrival of the ship on the Pacific Coast we have received a full supply of new bamboo carbon lamps. How well these have worked can best be seen from the following report of Chief Engineer Van Duzer: 'I have now one hundred and fifteen lamps in circuit, and have, up to date, run four hundred and fifteen hours and forty-five minutes without one lamp giving out.'"

In this celebration of Light's Golden Jubilee, let us not forget the inventors who had been working on and had practically perfected the electric incandescent lamp before Edison solved the problem of its commercial application.

In 1840, Sir William Robert Grove, a British jurist and scientist, made an experimental incandescent platinum coil lamp and, with current from a large number of his battery cells, used a number of these lamps to illuminate the auditorium of the Royal Institution during one of his lectures. Frederick de Moleyns, an Englishman, took out a patent on an incandescent lamp in 1841. J. W. Starr of Cincinnati, Ohio, patented a carbon in vacuum incandescent lamp in the year 1845. This was taken out in England. Starr, returning to the United States, died aboard ship at the age of 25. Had he lived, we might be celebrating the seventy-fifth anniversary of the practical incandescent lamp.

In the seventies in America this problem of subdividing the electric light received a great deal of attention from four very prominent inventors, William E. Sawyer, Moses G. Farmer, Hiram S. Maxim, and Thomas A. Edison. All of these produced practical incandescent lamps. The nitrogen filled lamp, as produced by both Sawyer and Farmer, has been revived within recent years as a great improvement over vacuum for some purposes. Maxim had a carbon filament in an atmosphere of rarefied hydro-carbon vapor, and some fifty of these lamps were installed in 1880 in the basement of the old Equitable Building in New York.

It remained for Edison, however, to bring out the constant voltage dynamo and the multiple parallel system of wiring which initiated modern incandescent lighting as a practical commercial undertaking and so made possible the great "white-way" idea of the metropolis as well as providing economical and convenient illumination for the humblest home.

Our Canadian Neighbors

Development of the Port of Vancouver and some Notes on Marine Construction at Victoria

THE Port of Vancouver began with a sawmill in 1865. A few years later this mill sawed the lumber which made the first outward cargo of the port, and the tall sailing ship that carried it inaugurated Vancouver's deep-water trade. This commerce has increased until now the port ranks second among Pacific Coast seaports in tonnage of inward and outward cargo and aggregate tonnage of ships. In Burrard Inlet there have been as many as fifty deep-sea ships at once, and the daily average seldom drops below thirty-five. These vessels range in importance from the great white "Empresses," finest and fastest in the transpacific passenger trade, to the strictly utilitarian steam tramp and the lumber carrying sailing ship. But among them are some of the largest and finest freighters afloat.

(Photo by Pacific Airways, Ltd.)

The Burrard Dry Dock at Vancouver, a completely equipped, modern steel shipbuilding and repair plant conveniently located to the center of Vancouver's busy waterfront.

Development of the Port of Vancouver has been making exceptionally rapid strides in recent years. In the neighborhood of $50,000,000 has been expended by public and private enterprise on docks, wharves, grain elevators, and terminal facilities since 1921; and this expansion has not been one step ahead of the enormous increase in business which the port has been called upon to handle.

Through the construction of the Second Narrows Bridge across the harbor at its narrowest point, aggregating an expenditure of $1,800,000, Greater Vancouver secured ten additional miles of commercial waterfront. This bridge also gives railway connection with other parts of Canada to a district that considerably adds to the industrial section of the Port of Vancouver.

The rapid increase of Vancouver's harbor business and its international recognition as one of the leading grain export centers of the world has necessitated the construction of several new piers in order to accommodate the growth of the deep-sea shipping trade. Outstanding among these improvements is the construction of the Ballantyne Pier by the Vancouver Harbor Commissioners and the Canadian Pacific Railway Company's pier which is declared to he the largest in the world to be built in such deep water.

Pier B.-C., Vancouver. This is the Canadian Pacific Railway Company's terminal, built recently at a cost of over $5,000,000. Picture shows C.P.R. liner Empress of Canada and Union Steamship Company's motorship Aorangi alongside the pier.

Constructed principally for the accommodation of its own fleet of deep-sea and coastwise vessels at a cost of approximately $5,000,000, the new Canadian Pacific pier was completed the latter part of 1927. Carrying three single-decked sheds with a net area of 200,000 square feet, this pier is 1100 feet in length by 331 feet in width. There is storage accommodation for approximately 17,000 tons of freight outside and adjacent to the pier with a trackage capacity of about 2000 cars.

Some idea of the business of the Port of Vancouver is gained from the figures for 1928 issued by the Harbor Board. Forty-six regular ocean lines operated in and out of the port, carrying the flags of twenty countries, and goods were shipped to 106 nations, while goods reached Vancouver from forty-three countries. Exports totalled 5,053,621 tons and were valued at $225,000,000, comprising chiefly lumber, logs, grain, flour, fish, metals, paper, and general manufactured products. Imports totalled 4,846,166 tons and were valued at approximately $300,000,000.

Canadian Pacific Development

Development on an unusually large scale will be included in the immediate activities of the Canadian Pacific Railway on the Pacific Coast not only in connection with the land rail facilities serving the port, but in the two fleets, ocean and coastal, operated by the company out of Vancouver.

More than 65,000 tons of shipping tonnage is now under construction or contract in British ship yards, comprising two great liners, the Empress of Britain, 40,000 tons, and the Empress of Japan, 25,000 tons, and two new coastwise steamers of 5300 gross tons each. The Empress of Japan will be added to the Pacific fleet in 1931, while the two new coastwise steamers will ply on

the Vancouver-Victoria night route in the spring of 1930.

The Pacific fleet service is now maintained by the Empress of Asia, Empress of Russia, and Empress of France, the latter an Atlantic vessel taking the place of the regular flagship, Empress of Canada, which is now being re-engined in a British ship yard. The new Empress of Japan will surpass all four in tonnage and speed, her contract speed being in the neighborhood of 26 knots an hour.

The fleet of the British Columbia Coast Steamships Service now consists of 23 vessels, of which 17 are passenger ships, two freighters, and four tugs, the whole having an approximate tonnage of 50,000 tons and including the two blue ribbon craft, Princess Kathleen and Princess Marguerite, of 5800 tons each, considered among the finest coastwise vessels in the world.

The two new vessels now under contract to be delivered in the spring of 1930 have been specially designed for the night run between Vancouver and Victoria. They are to be 5300 tons each, with increased cabin space. Each will be capable of carrying 400 night passengers with sleeping accommodations or 1500 passengers on the day run. They will bring the list of passenger vessels in the fleet to 19.

Two other new vessels have been recently added to the British Columbia Coastal fleet, Princess Elaine, now on the Vancouver-Nanaimo run, in 1928, and the Princess Norah in 1929, the latter built for the West Coast of Vancouver Island passenger service, which it will enter this spring.

These shipping additions as well as new locomotive power for the westward haul, are in line with the steady development of the Port of Vancouver.

Brockton Point, entrance to Vancouver Harbor, showing C.P.R. coastwise passenger liner Princess Kathleen entering.

Marine Construction and Work Boat Notes

The Victoria Pile Driving Company, Victoria, British Columbia, has recently been awarded two contracts, one for the construction of a concrete pier for the British Columbia Cement Company and one for a new wharf for the Imperial Oil Company, total cost about $35,000.

The Pacific Shipyards at Victoria have under construction a fishing boat 60 by 15 by 7 feet for the Canadian Fishing Company to be powered with a 65-horsepower Washington-Estep diesel. There is also under construction at this yard for W. J. H. Holmes an auxiliary, two-masted, sailing yacht 36 by 11 by 7 feet. This boat will have a 24-horsepower gas engine.

The **Turpel Marine Railways** has recently changed hands and is now operating under the name of **Point Hope Marine Railway, Ltd.**, with offices and yard at Point Hope, Victoria.

The **Canadian Fairbanks-Morse Company, Ltd.**, office at Victoria, reports considerable recent business in substituting Fairbanks-Morse diesel engines for gas engines in workboats.

Among others, they have put a 35-horsepower diesel into the launch Evelyn, which serves the Dominion Government Quarantine Station at Williams Head. It is claimed that this installation drives the boat at a faster speed on about one-fourth the cost for fuel as compared with the gas engine displaced.

A 45-horsepower, 4-cylinder, Fairbanks-Morse full diesel has been installed in the fishing boat Calm Creek. This boat tows logs during the winter months and is used as a purse seiner during the pilchard fishing season.

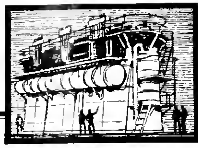
A 45-horsepower, 4-cylinder unit is being installed in a new 50-foot boat for E. F. Jennings of Bamfield, Vancouver Island, to be used in the fresh fish business, and a 75-horsepower Fairbanks-Morse 3-cylinder full diesel is to be installed in the new British Columbia police patrol boat now building at Yarrows, Ltd., Victoria.

View of the inner harbor and shipping, Victoria.

Trade Note

Petty & Wherry, with offices and warehouses in New York City and Brooklyn, have just purchased the business, stock, and good will of The Coleman Power Transmission Company of Brooklyn.

Petty & Wherry are transmission specialists, covering Greater New York. They also represent some of the largest transmission manufacturers in the country including Dodge Mfg. Co., and Chain Belt Co. W. E. Petty, president, states it is their intention to continue operating the Coleman Power Transmission Co. with even greater intensity than in the past.



In the Engine Room

Mechanics for Marine Engineers

Part VIII: Reciprocating Parts of Steam Engine

By A. L. Becker

FIGURE 10 may represent the main reciprocating parts of a steam engine drawn to scale.

Considering the top end of the connecting rod: Draw a line a.b. parallel to A.B., the piston rod, the length of this line to represent the area of the cylinder multiplied by the steam pressure to a convenient scale. From b. draw a line b.c. parallel to the connecting rod until it intersects a line drawn from a parallel to C.A. The stress diagram gives the stress in the piston rod a.b., in the connecting rod b.c., and the thrust of the cross head against its guide c.a. The broken line shows the corresponding stresses for a new position of the crank.

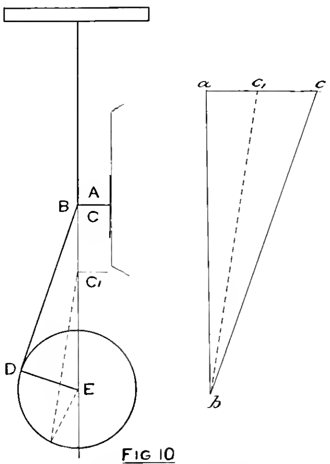


Fig 10

Divide the crank pin circle into, say, 24 equal parts, and draw the stress diagram as for the position D. for each point of division. Take moments about E. by multiplying the stress in the connecting rod (as b.c.) by the perpendicular distance of the centerline of the connecting rod from the point E. in all the above noted positions. These products or moments may be plotted to scale in a second circle divided into the same number of points, and if these points be connected by a fair line, this line will represent the curve of the turning moments of one engine.

Further, if there are two cranks at right angles, the moment diagram may be constructed for two cranks by adding to the moment of the first crank in any position the value of the moment in the sixth position ahead. There being 24 divisions, with the second crank at right angles it is always six divisions from the first crank. The combined diagram can then be constructed and the turning moment determined for any position of the engine.

The above will indicate the procedure to follow in a triple expansion engine to determine its curve of combined turning moments. The steam pressure may be taken directly from indicator cards. It is evident that an engineer by properly adjusting the cut-offs can adjust his engine to an approximately uniform turning moment in so far as the effect of the forces derived from the steam pressure is considered. The inertia forces induced from the effects of the reciprocating weights and the weights rotating with the crank shaft are considered under the subdivision of mechanics known as Dynamics; and, as these later forces exert a decided influence on the turning moment and balance of an engine in motion, these conditions should be analyzed when the effect of vibration is the prime consideration.

The statical turning moment for starting the load or lifting the load at very slow speeds as given for the double engine will suffice as given.

The foregoing is given to illustrate the possibilities of what is termed the "Safety Valve Rule." If the requirements for an original license clearly outlined the fundamental principles underlying an engineering training, the applicant would at least acquire the elements of constructive knowledge of his profession, which knowledge would automatically grow and expand from the effects of contact with and the use of equipment in which the application of his acquired knowledge would be recognized. This would be particularly true if marine superintendents or those having charge of marine personnel will align themselves with the progress of modern industrial development and become, as defined by one of our greatest industrial leaders, "human engineers."

Trade Note

According to an announcement just received from the **Busch-Sulzer Bros. Diesel Engine Co.**, St. Louis, at meeting of board of directors, held March 28, 1929, August A. Busch was elected chairman of the board; Edward B. Pollister was elected president, succeeding August A. Busch; and C. Drummond Jones, formerly fourth vice-president, was elected second vice-president, succeeding Mr. Pollister. Mr. Pollister continues to act as general manager, and Mr. Jones as secretary and treasurer.

Problem of Choice in Propulsion Machinery

YEAR by year the types and forms of marine propulsion machinery multiply and it becomes increasingly important that superintendent engineers, and operating marine engineers who desire to become superintendents, keep themselves informed on the progress of this development. This idea is conveyed very vividly by the following article published some time back in the Journal of Commerce, London.

Never has there been a time when propelling machinery for ships was more in the melting pot than at present. Steam is raised by coal in some ships and by oil in others. The coal may be shovelled into the furnaces by firemen or fed to them by mechanical stokers. Alternately, it may be powdered and carried by air to suitable burners which give huge jets of intensely hot flame without any firebars. Scotch boilers may be favored, or preference may be shown for water-tube boilers; and steam pressures vary between 180 and 550 pounds per square inch.

Coming to the conversion of steam into power, we find this being done by reciprocating engines, by turbines, and by a combination of both. The turbines drive propellers directly or transmit their power through reduction gears or through dynamos and electric motors.

Even greater variations are to be found in motor engines. They may be four-stroke or two-stroke, and either single-acting or double-acting. Single-acting engines may have trunk pistons or be fitted with piston rods and crossheads. Either single-acting or double-acting engines may run slowly and drive propellers directly, or they may run fast and transmit their power through reduction gears or through electric motors. Finally, we have the opposed-piston engine which, in England, is only being built to run slowly for direct driving.

All of these variations in steam machinery and in motor engines are to be found in big, ocean-going ships, either in service or under construction, many of which are passenger liners. Of these the following examples are worthy of mention:

The recently-launched Peninsular and Oriental liner Viceroy of India, with turbine-driven electric generators which supply current to motors on the propeller shafts; and having oil-fired water-tube boilers with a working pressure of 350 pounds per square inch;

The biggest French liner, Ile de France, with turbines that drive triple screws direct, and which are supplied with steam at 230 pounds per square inch, by oil-fired Scotch boilers;

The two new North German Lloyd ships, Bremen and Europa, with single reduction gear turbines, working on a pressure from 350 to 400 pounds per square inch;

The Blue Star cargo liner Stuartstar, which has been fitted with apparatus for burning pulverized coal in two of her four boilers; and another vessel which has been ordered for running on this fuel;

The Selandia and other early motorships, which were fitted with four-stroke, single-acting motor engines. (This type has been installed in more vessels since than any other, and notably into the first passenger motorship);

The cross-channel boats between Harwich and Esbjerg, with high-speed, single-acting engines with trunk pistons;

The new triple-screw White Star liner Laurentic with reciprocating steam engines coupled to the wing propellers and delivering their exhaust to a turbine on the middle shaft. Steam for this combination is raised by coal in hand-fired Scotch boilers to a pressure of 220 pounds per square inch;

The Royal Mail Steam Packet Co.'s liners Asturias and Alcantara, the Union-Castle liner Carnarvon Castle, and many other large motorships, propelled by double acting, slow-running engines;

The two Panama-Pacific liners, California and Virginia, the largest commercial vessels with turbo-electric drive, oil fired boilers;

The Brunswick with fast-running, single-acting four-stroke engines and electric transmission;

The Wulsty Castle, with a four-stroke, double-acting, high-speed engine which drives the propeller through reduction gear;

The New Zealand passenger motor liner Aorangi with single-acting, two-stroke engines;

The Augustus, the world's largest motorship, with two-stroke double acting engines. Also the new submarine depot ship Medway for the British Admiralty;

Two new Hamburg-South American liners are propelled by fast-running, two-stroke, double-acting engines that drive the propellers through reduction gears;

The passenger motor liner Bermuda with opposed-piston engines; and many other ships with similar machinery;

The Britannia, with quadruple engines and exhaust turbine; oil-fired boilers;

The Raby Castle, motorship with exhaust turbo-charging.

That so many different types of machinery should be used for propelling similar types of ships is remarkable. One must be more efficient than any other, but we seem a long way yet from finding out which. Also, the trade in which a ship is engaged affects the practical value of its particular type of propulsion. What owners want is reliability with fuel economy at a low first cost, and with minimum space taken up by the machinery and bunkers. It is now generally admitted that motor engines are as reliable as steam machinery, that they consume less fuel, and that they take up less space. At present they cost more than steam engines or turbines and boilers, but the two-stroke, double-acting engine bids fair to wipe out this difference in the near future, if indeed it has not already done so.

Factors other than fuel consumption affect the comparative costs of oil-fired steamers and motorships. Of these space is the most important. Even high-pressure steam turbines and water-tube boilers take up more room than diesel engines. The bunkers also have to be larger for steam machinery, because more oil is consumed, while the boilers need some attendance, which entails a larger wage bill for the engine-room staff than for a motorship.

The lowest consumption of coal in a steamer was obtained in the Canadian Pacific cargo liner Beaverhill. This vessel is fitted with geared turbines, for which steam at 250 pounds pressure is provided by a combination of Scotch and water-tube boilers. During a ten-hour trial the consumption of coal worked out to only 1.07 pounds per horsepower hour for all purposes. This figure as it stands gives a lower fuel bill than for any motorship, and, according to results obtained in the Stuartstar, powdered coal should reduce it by at least 18 per cent,

and the cost of the coal by 33 per cent.

At present powdered coal has to be pulverized at the time it is used, because it cannot be safely stored. But it is by no means improbable that coke from low temperature carbonization of coal will soon be available. This fuel would be powdered on shore, since it could be safely stored in bunkers, and it would be conveyed from the bunkers to the furnaces by air in pipes almost with the same facility as oil. Very little labor would, therefore, be entailed. But it must not be forgotten that although the fuel bill may be much lower for powdered-coal-fired steam than for diesel engines, the space taken up for the machinery and the bunkers would be greater, and there would be some extra labor for looking after the boilers. Powdered coke, however, is the most hopeful development for steam.

Motorship enthusiasts are looking to the two-stroke, double-acting engine to keep "their end up." It is the least costly type to build, and it runs with the smoothness of a steam engine, owing to the perfect cushioning of the moving parts. All the best known builders of marine diesel engines have brought out two-stroke, double-acting models or are experimenting with a view to so doing. It is now claimed that there are as many, if not more, double-acting, two-stroke engines now actually on the market and available for installation in ships than of any other type. The fact that the British Admiralty have adopted this design for the engines of the Medway is also significant.

Centrifuging Diesel Fuel Oil

By O. H. Barnhill

CENTRIFUGING lubricating oil has proved so successful that practically all marine engines are now supplied with machines for performing this process. Cleaning diesel fuel oil by centrifuging is a comparatively new practice, but is rapidly gaining in favor with progressive operators.

Gauze strainers are useful, but their range of operation is limited. If made sufficiently fine to exclude practically all solid particles they soon become clogged and unable to function without cleaning. Furthermore, they do not remove from oil one of its worst impurities—water.

In small installations it is sometimes practicable to use the same centrifuge for cleansing both fuel and lubricating oil. This is being done successfully on Guy Silva's new tuna boat, the Emma R. S. at San Diego. A rod connecting the two supply valves automatically closes one when the other is open, thus preventing accidental mixture of fuel and lubricating oils. This device was invented by Captain Silva.

Troubles from Dirty Oil

The importance of centrifuging diesel fuel is indicated by the following formidable list of diesel engine troubles caused by unclean oil:

Exhaust valves sticking, irregular firing, engine laboring under overload conditions, rust on cylinder walls, deposit on walls of combustion chamber, carbon trumpets on combustion side of spraying orifice, contaminated lubricating oil, dragging between piston and cylinder, seizure, leaky valves, excessive wear on cylinder liners, injection feed nozzles and fuel pumps, piston blow-by, obstruction of fuel pulverizing devices, wearing of needle and sprayer valve face, carbon and sediment deposits on piston heads, feeble firing and misfire, heavy oils too viscuous to feed well yet unsafe to heat sufficiently for good combustion. All these troubles may be wholly or partly eliminated by centrifuging fuel oil.

Oil companies usually are blamed for not furnishing clean fuel oil. This, however, is impracticable. Fuel oil might be centrifuged before selling, if it could be protected from contamination until it reached injection nozzles. However, foul tank cars, dirty drums, leaky tank roofs, foul pipe lines and pumps, and careless handling contribute water, mud, sand, rust, and other impurities.

In land installations gravity pulls most foreign matter to the bottom of the oil tank, permitting comparatively pure oil to be drawn from upper strata. The motion of a vessel, however, agitates oil and keeps impurities in suspension. Even in stationary tanks there is little gravity separation in the heavier grades of oil, which are the cheapest and contain the most energy and therefore should be used wherever possible. Perfect combustion of heavy oil depends largely upon a clean, uniform fuel supply at the proper temperature. Centrifuging renders possible these conditions.

Heavy oils are the hardest to centrifuge, because of their great viscosity. This difficulty is overcome by heating, which reduces oil viscosity sufficiently for efficient centrifuging. The temperature of 30-degree Baume oil needs to be raised to only about 120 degrees, while 16 to 20-degree Bunker C fuel oil with a flash point of 150 degrees Fahrenheit needs to be heated to 170 degrees, which reduces the viscosity from 16 degrees Engler at the former temperature to 8 degrees at the latter. In some cases it is necessary to heat heavy oil to 210 degrees before centrifuging.

Fumes escaping from oil heated well above the flash point would create a fire hazard and might necessitate higher insurance rates. This difficulty may be overcome by substituting for an open centrifuge one with all the working parts enclosed in an air-tight casing, which effectually prevents leakage of inflammable vapors. Intake and outlet pipes are air-tight and no unions need to be separated in cleansing the machine.

Another point worthy of consideration is that some fuel oils contain so much water that when heated sufficiently for effective combustion, inflammable vapors form. In one oil this danger point was 170 degrees. After centrifuging out the water and other impurities, this fuel could be safely heated to 190 or 195 degrees, sufficient for perfect combustion.

Fuel may be warmed with electric heaters immersed in the oil lines or with hot water or steam coils placed in the fuel tank.

Water In Fuel Oil

The trouble caused by even a small quantity of water in fuel oil is not generally realized or understood. If moisture were completely and uniformly suspended in the oil it would do little harm, because the governor automatically would in-

crease the charge sufficiently to compensate for the useless water content.

Water, however, being practically insoluble in fuel oil, is very unevenly suspended in small globules or pockets. These cause irregularity of engine speed, sudden slowing up, misfire, overload, imperfect combustion and fouling of cylinder lubricant. The only perfect remedy for these troubles is centrifuging.

When the fuel pump strikes a water pocket it draws in a charge composed largely or entirely of water. The result is misfire or very feeble firing. In the former case the oil in the charge is splattered against the cylinder walls, contaminating the lubricant. The engine immediately slows up, causing the governor to give a larger fuel charge. Until the engine regains normal speed it operates under overload conditions.

Contamination of lube causes a drag between the piston and cylinder and in extreme cases results in seizure. Irregular firing, indicated by black smoke issuing intermittently from the exhaust pipe, causes the formation of deposits on the walls of the combustion chamber and carbon trumpets on the combustion space side of the spraying orifice.

Burning wet oil sometimes causes other troubles. Low-gravity fuel often contains considerable sulphur, which burns to sulphur dioxide. The latter does no particular harm when the engine is running, but when the machine is stopped without first flushing out the burned gases, sulphur dioxide may combine with condensed gases and become a corrosive. In this manner two harmless substances sometimes form a rust-producing compound inside the cylinder.

Light oil with little sulphur sometimes is used just before the engine is stopped, in order to remove heavier oil from pump and fuel lines, where it is liable to solidify and cause trouble in starting.

Centrifuge Experience

Most noncombustible, non-volatile material in fuel oil is abrasive, therefore increases wear on cylinder liners, piston rings, and other friction parts of a diesel engine. These impurities are mostly sand and rust from pipes and storage tanks and mud from oil wells. The quantity of abrasive material introduced into a cylinder at each stroke is very small, but it gradually accumulates until enough is present to cause serious damage.

The coarser impurities are deposited in the cylinders and combine with the lubricant to form an abrasive paste. From one to ten pounds of solids are present in 2500 gallons of average fuel oil and about half of it is of an abrasive nature.

Sediment from dirty fuel oil sometimes lodges on piston heads and valve seats, causing the latter to leak and necessitating their removal for cleaning. As much as 5/8 inch of mud and sand has been found on piston heads. Centrifuging entirely overcomes this trouble.

An average of one pound of rust, mud, sand, and sludge was centrifuged out of each 20 barrels of one lot of the best diesel fuel oil obtainable. In another case a pound of sludge was removed from every four barrels of oil. Average tests show one pound of impurities removed by centrifuging from each 12 barrels of oil.

Centrifuges removed an average of 21 pounds of solid matter daily from 210 barrels of fuel oil used by two modern motorships. During a 10-months run, over three tons of solids were separated by centrifuging from the fuel used by these power plants. Think of the engine troubles which would have been caused by running more than 6000 pounds of sediment through these huge diesels!

"Centrifuging fuel oil has cut our valve maintenance expense in half," reports the first engineer of one of these vessels. "Machine work on valves no longer is necessary and grinding has been greatly reduced. Fuel pump packing lasts three times as long. Piston blowout has been entirely eliminated. The life of auxiliary exhaust valves has been increased 400 per cent and main engine cylinder liner wear cut in half."

The foregoing is striking evidence of the practical value of centrifuging diesel fuel.

Three 500-horsepower 4-cylinder, 4-cycle diesels using California Residuum 19-degree fuel oil were much improved in operating efficiency by fuel oil centrifuging. From 77,336 gallons of oil 146 pounds of solids was removed and 277 gallons of water taken out of 23,116 gallons of oil. Fuel was heated to 170 degrees and centrifuged at the rate of 268 gallons per hour.

Previous to being cleaned in this manner the oil could not be heated above 170 degrees without vaporizing, but after centrifuging it is safely heated to 190 and 195 degrees. The high moisture content of the fuel did not permit heating it to the proper temperature for good combustion, until the water was removed by centrifuging.

Considerable trouble formerly had been caused by sediment lodging on piston heads and valve seats, causing the latter to leak. Centrifuging eliminated these difficulties, causing the valves to give excellent service.

An Improved Cargo Separator

IN stowing cargo in ships' holds various materials and devices have been used as separators, marking the various lots so that they may be broken out, checked, and delivered to consignees as received, checked, and stowed at point of shipment. Battens, paper in several forms, cloths, ropes, and yarns are commonly in use for this purpose. None of these materials, however, is entirely satisfactory.

William G. Perow, port engineer at San Francisco for the Lukenbach Steamship Company, has inaugurated a new method and device for separating cargo lots, and is giving it a thorough trial on the Luckenbach intercoastal freighters. The device consists of a net 31.2 feet square made up of six-thread manila rope with 1.6-foot mesh. These nets are particularly applicable to such commodities as sugar, beans, or grain in sacks. When the net is laid over a lot, that lot is separated from the lot above.

Mr. Perow claims:

That the net will outlast many paper or cloth separators, and is therefore more economical;

That the net is more positive in its separation than either battens or paper, since no sack will pass through the mesh;

That the net is more easily handled, being lighter than other separators; and

That it can be rolled into very compact form for stowage on return trip or for storage.

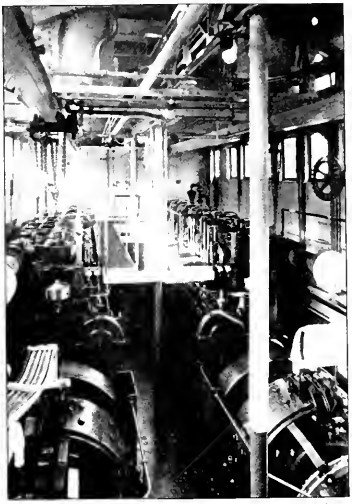
Tubbs Extra Superior Six Twine manila rope is being used to make these separator nets for Luckenbach.

Workboats and Their Power Plants

River Towboat Warrior

Most Powerful Diesel-Electric River Towboat

THE towboat Warrior, owned by the Tennessee Coal, Iron & Railroad Company of Birmingham, Alabama, is the largest and most powerful diesel river towboat yet constructed and is also the largest application of diesel-electric drive for this service. She was launched on January 4, 1929, and delivered to her owners on January 21 and is now in operation on the Warrior River between Birmingport and Mobile, a distance of 492 miles. Conditions of service are most severe and maneuverability is of prime importance, due to the tortuous bends and curves of the river, as well as the seventeen locks, which maintain a minimum channel of only 8 feet. These locks are 280 feet in length by 50 feet in width and will handle a tow of towboat and seven barges in two locking operations.



Interior of the engine room of the diesel-electric river towboat Warrior, showing two 550-horsepower Nelseco diesel engines each direct-connected to a 335-kilowatt General Electric generator.

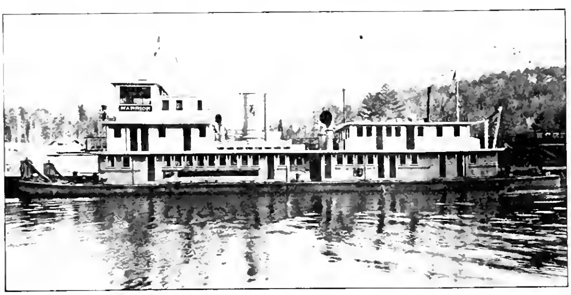
The Warrior is of steel. She was designed and her construction was supervised by Nelson L. VanTol, naval architect for the Tennessee Coal, Iron and Railroad Co. She was built by the American Bridge Co. of Ambridge, Pennsylvania, and machinery installation was carried out by the Carnegie Steel Co. of Pittsburgh. Her general characteristics are as follows:

Length between perpendiculars	140′0″
Width over-all	25′0″
Draft	7′0″
Loaded displacement, tons	575
Net tonnage	204
Fuel oil capacity, tons	70
Towing speed, with 7 barges	5¼ M.P.H.
Main engines	two Nelseco
Horsepower at 250 R.P.M.	550 B.H.P.
Electrical apparatus	General Electric Co.
Type of drive	Twin screw tunnel stern

The barges towed each measure 25 by 140 feet and have a cargo capacity of 600 tons on 7½-foot draft. As the light displacement of the barges is approximately 160 tons each, the total tow, exclusive of the towboat, amounts to approximately 5325 short tons.

The two main propelling motors, each of 400 shaft horsepower, drive propellers of 7 foot 3 inch diameter at a speed of 140 revolutions per minute. The exceptionally fine handling ability of the boat is explained by the use of two steering rudders aft of the propellers, together with two backing rudders located forward of the propellers. These sets of rudders, each controlled independently, permit unusual flexibility of control.

The two 550 brake horsepower Nelseco diesel engines each drive 335-kilowatt, 250-volt direct current General-Electric generators with direct-connected exciters of 40 kilowatts each. The propelling motors, as mentioned above, are 400 shaft horsepower each and are controlled either from the pilot house or engine room through the Ward Leonard system. All auxiliaries on the boat are electrically driven, and a motor-driven refrigerating plant is installed. The boat is also equipped with the latest type marine radio set furnished by the Radio Corporation of America.

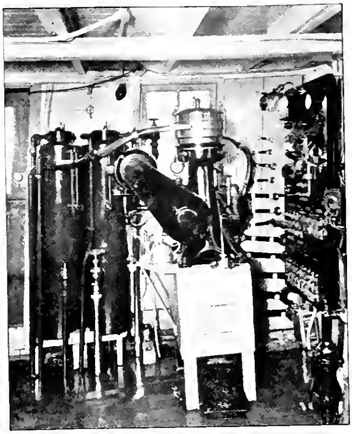


Broadside view of diesel-electric river towboat Warrior.

De Laval Oil Purifier Saves Fish Cargo

THE value of the De Laval oil purifier as an auxiliary to the marine power plant was strikingly shown on a recent voyage of the Emma R. S., a new tuna fishing boat owned by Captain Guy Silva, and operating in Mexican waters out of San Diego, California.

This vessel is fitted with a De Laval centrifugal oil purifier, with pipe connection arranged so that either fuel oil supply or lubricating oil supply to the main engines can be centrifuged and purified before being used. The engines of the Emma R. S. have worked perfectly, a considerable amount of sludge and grit being removed regularly both from fuel and lubricating oil, thus saving considerable maintenance work and wear and tear on the engines.



De Laval fuel oil purifier No. 302 installed on the Puget Sound tug Annie W. This purifier services a 275-horsepower Atlas-Imperial diesel. Note pan of dirt below the purifier stand removed from seven hours' run of lubricating oil.

It was an accident on a recent fishing trip which demonstrated a profit saving ability on the part of the De Laval oil purifier that had not been contemplated when the installation was made. This accident resulted in a broken pipe, draining all the lubricating oil supply on board into the bilges, where it was immediately mixed with water, sludge, and other filth. This happened on the way home from the fishing grounds when the boat was loaded with 100 tons of valuable fresh fish and when any delay would have been very costly.

The dirty oil and water were pumped out of the bilge and run through the oil purifier, from which there emerged apparently pure lubricating oil of good quality. "By this means," relates Captain Silva, "we were able to salvage 180 gallons of lubricating oil and proceed safely to port with our catch of fish in good condition." By this one performance that oil purifier far more than paid for the entire cost of its installation.

In many Pacific Coast marine power plants, small and large, the De Laval oil purifier is protecting the cylinders and the bearings of diesel engines from impure fuel oil and impure lubricating oil and is standing by ready for just such emergencies as occurred on the Emma R. S.

The boat here shown in frame is said to be the largest craft yet built in Monterey, California. She is at the yard of Pasquinucci Orlando. She is 61 feet long, 17 feet beam, and is to be powered with a 90-horsepower Washington-Estep diesel.

Work Boat Notes

Lake Union Drydock & Machine Works, Seattle, recently completed a 76-foot service boat for the American Can Company for operation in Alaskan waters. The boat is named Congo and is powered with two 175-horsepower **Hall-Scott** engines, giving a speed of 15 knots.

This yard is building a traveling salesman's boat for the Yukon River for the National Grocery Company of Seattle, 50 feet long, 12 feet beam, 3 feet depth, to have 12 miles an hour speed.

Another job is a snag boat for the United States Army Engineers, 140 feet long, 34 feet beam, 18 inches draft, to be equipped with 75-foot crane.

Harbor Boatbuilding Company, Terminal Island, San Pedro, recently completed the fine offshore fishing boat Southern Cross, one of the finest of the new type fishing boats built for tuna fishing out of San Pedro. The Southern Cross was designed by Edson B. Schock and was built in conjunction with Delano Brusstar of Long Beach. She is 125 feet long and is powered by a 450-horsepower **Western-Enterprise** diesel engine, with a 32-horsepower auxiliary diesel engine for generating power for auxiliary and lighting purposes. She is refrigerated throughout her fishing holds, with capacity for 200 pounds of fish, and has capacity for 3600 gallons of fresh water. The Southern Cross has a fuel oil capacity for cruising 4500 miles and, under the command of Captain Tony Zancich and a crew of 15, has departed on an exploration cruise for additional tuna banks in the waters off the Mexican and Central American

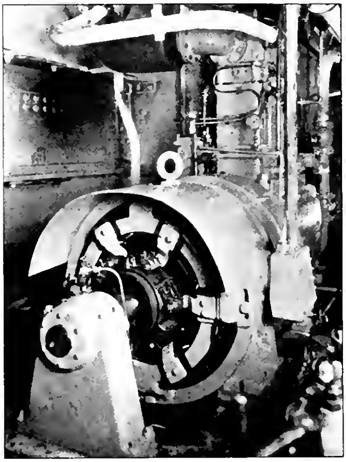
(Continued on Page 27, Blue Form)

Triumph and Defiance

Complete Electrification of Two Shipping Board Freighters with Diesel-Electric Propulsion Machinery

TWO interesting recent additions to our merchant fleet are the diesel-electric freighters Triumph and Defiance which have been converted from steam propulsion by the Shipping Board for service in the Roosevelt Steamship Line. Diesel-electric propulsion was chosen for these vessels after a careful study was made of such requirements as speed, space, cost, and weight.

The conversion of these two cargo carriers, which are sister ships, included structural changes to the stern to reduce eddy-making tendencies, and an increase in length of eleven feet on the water line to give finer lines. With these improvements to the hull it was found that the required speed of 13 knots could be obtained with about 4800-brake-horsepower for all purposes by using diesel-electric drive.



Auxiliary generating set.

After conversion, the principal dimensions of the freighters are as follows: length over-all, 468 feet 6 inches, molded breadth, 56 feet; molded depth, 38 feet. The deadweight capacity, including fuel, water, and stores, is 10,500 tons. Fully bunkered, the net cargo capacity is 9128 tons. The main propulsion motor develops under normal rating 4000 shaft horsepower.

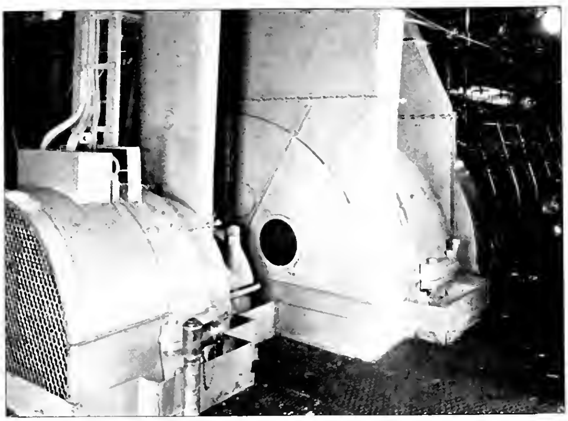
The complete electrical equipment of the propulsion and auxiliary machinery of both the Triumph and Defiance was supplied by the Westinghouse Electric & Manufacturing Company.

The propelling machinery installation comprises four main generating units, each consisting of a 1200 brake-horsepower, 4-cycle, single-acting, air-injection, trunk piston type McIntosh & Seymour engine, operating at 250 revolutions per minute and directly connected to an 800-kilowatt, 375-volt, main generator and a 100-kilowatt, 240-volt exciter. The latter furnishes power to the auxiliary bus and excitation for the main generator and propulsion motor. The propelling motor is a double-armature machine, developing 4000 shaft horsepower at 60 revolutions per minute, with 750 volts per armature. The generators and the motor are enclosed and forced ventilated by two motor driven blowers.

The main control switchboard is located on the port side of the engine room aft and is of the dead-front type. Provision is made for connecting the main generators either individually to an auxiliary power bus to supply power for cargo handling or to the propulsion circuit. Mechanical interlocks are installed to prevent placing more than one main generator on the auxiliary bus at a time. The vessel can be propelled by any number of main generators in operation or with one motor armature cut out of the circuit. For full power, the propulsion circuit is so arranged that the propulsion motor armatures are interposed between the generator armatures, with the result that it is impossible to get more than 750 volts to ground, although the total normal generated voltage is 1500, and the advantage of reduced current of a 1500 volt system is obtained.

Provision is made for complete control of the propulsion motor from the pilot house as well as by duplicate potentiometer rheostats at the engine room switchboard.

For auxiliary power the switching arrangement is such that three of the four main generating units may be used simultaneously, although it is impossible to parallel the machines. This is done by placing one on the excitation bus, the second



One of the main generating units with exciter in the foreground and 1200 brake horsepower McIntosh & Seymour diesel in the background.

on auxiliary bus No. 1, and the third on auxiliary bus No. 2. This affords ample power for all auxiliary purposes at sea.

The deck auxiliary machinery, which is electrically driven, comprises twelve 25-horsepower cargo winches, one 25-horsepower warping winch, one 65-horsepower anchor windlass, and one 45-horsepower steering gear. The motors, brakes, and master switches of the cargo winches and warping winch are waterproof, while the controls and resistors of these machines are enclosed in special steel deck houses and are therefore not waterproof. The motor of the steering gear is not exposed and is a 230-volt, 600-revolutions per minute, open type machine. The motor, brake, and control of the anchor windlass are water-proof.

The underdeck auxiliaries, also electrically driven, include two main blowers of 30 to 71 horsepower each supplying ventilation at the rate of 35,000 cubic feet per minute to the main generators and propulsion motor as well as to the engine room itself; two fire and sanitary pumps of 11 to 25 horsepower; two bilge and ballast pumps of 6 to 8 horsepower; one fuel oil transfer pump of 5.5 to 7.5 horsepower; four lubricating oil and four circulating water pumps of 42 to 50 horsepower each; one fresh water pump and one drinking water pump of 2 horsepower and 1 horsepower, respectively.

Outside of the engine room there are one ice machine driven by a motor of 5 to 7.5 horsepower, one machine shop motor of 5 to 7.5 horsepower, one machine shop blower of 0.5 horsepower; and one ice machine room blower of 0.75 horsepower.

The work of converting the Triumph and Defiance was under the charge of William Francis Gibbs, naval architect of New York City. The Triumph was reconditioned in the Boston Navy Yard and the Defiance in the Norfolk Navy Yard.

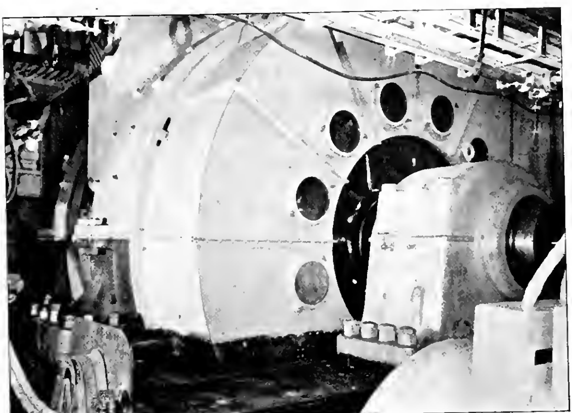
Electrically driven cargo winches.

Sperry Gyro Incorporated

As was briefly noted in the March issue, the Sperry Gyroscope Company, together with all its assets, obligations, and business in all parts of the world was acquired on January 21, 1929, by Sperry Gyroscope Company, Incorporated.

The stock of this new corporation is owned by North American Aviation, Incorporated, of which C. M. Keys is president. The executive personnel of Sperry Gyroscope Company, Inc., includes: J. A. B. Smith, chairman of the board; Thomas A. Morgan, president; R. E. Gilmour, vice-president; Thomas B. Doe, vice-president; H. H. Thompson, secretary; and John Sanderson, treasurer.

No changes in the Sperry organization or policies are contemplated, other than those calculated to increase confidence and extend more useful service to those using Sperry apparatus.



The main propulsion motor, a Westinghouse double armature unit developing 4000 shaft horsepower at 60 revolutions per minute.

Trade Notes

It is reported that the Kieckhefer Container Co., Camden, N.J., manufacturer of cardboard containers, has decided to handle its own products by water between Camden and the Pacific Coast, the first sailing being the steamer Maltran. J. J. Moore & Co. are San Francisco agents.

Another firm said to be preparing to enter the intercoastal freight carrying trade is Shepard & Morse, of Boston, wholesale lumber dealers. This firm recently purchased the Shipping Board freighters West Cherow, Westland, and Westbrook.

The Haviside Company of San Francisco, Harry Haviside, president, has purchased the wooden steamer Pasadena from the Albion Lumber Co. and will fit the vessel for salvage work. Besides the latest equipment for this type of work the vessel will have a high powered wireless set. The Pasadena is 141 feet long, 31.1 feet beam, 10.4 feet depth, and was built in San Francisco in 1887.

Auxiliaries—Ship Supplies—Marine Equipment

Waste Heat Boilers

Foster Units Installed to Advantage on Shipping Board Motorships

EIGHT United States Shipping Board vessels are now being converted from steam to diesel propulsion. Heretofore a shortcoming of marine diesel engines has been lack of steam for heating, necessitating a separately fired boiler, but this deficiency is now being overcome by Foster waste heat boilers.

The eight vessels for conversion are: City of Ellwood, Galveston, Jeff Davis, New Orleans, Oldham, Potter, Ward, and Wichita. 4000-brake horsepower, double-acting, 2-cycle, engines made by Hooven, Owens, Rentschler Company are being installed in the New Orleans and Wichita by the Federal Shipbuilding Company. 4000-brake horsepower, 2-cycle, single-acting engines made by Busch-Sulzer Bros. Diesel Engine Company are being installed in the City of Ellwood and Ward by the Newport News Shipbuilding and Dry Dock Company. 3950-brake horsepower, double-acting, 4-cycle, engines made by McIntosh & Seymour Corporation are being installed in the Galveston and Oldham. 3925-brake horsepower, 2-cycle, double-acting engines made by Worthington Pump & Machinery Company, are being installed in the Potter and Jeff Davis by the Maryland Shipbuilding and Dry Dock Company.

TEST RESULTS ON HAMILTON—M.A.N. DOUBLE ACTING, TWO CYCLE AIR INJECTION DIESEL ENGINE EQUIPPED WITH FOSTER WASTE HEAT MARINE BOILER

Steam pressure # sq.in. gage	43.5	Indicated horsepower	4812
Feed water pressure #/sq.in	60	Brake horsepower	4019.5
Back pressure on engine exhaust, in.Hg	0.5	Fuel consumption # hr	1669.5
Main engine average indicated pressure #/sq.in	82	Fuel consumption #/IHP hr	0.346
Temperature gases entering boiler, deg. F. (thermometer)	538	Fuel consumption #/BHP hr	0.438
Temperature of gases leaving boiler, deg. F. (thermometer)	346	Main engine speed Rpm	110
Water temperature entering boiler economizer deg. F	168	Water feed to boiler #/hr	2820
		Exhaust gas #/hr	85000
		Stroke main engine inches	47.25
		Diameter cylinders	27.5
		Thermal value of fuel B.T.U./lb	19000

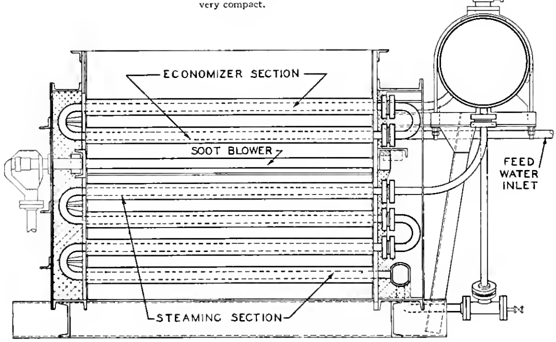
Exhaust gases from each engine will flow through a Foster waste heat boiler placed between the engine and stack. The waste heat boiler besides serving as steam generator will aid materially the muffling of the sound of the exhaust Steam generated by the boilers can be used for a number of purposes, chief of which will be heating, both of the ship's quarters and the fuel oil.

An interesting feature of the installation is the ability to run the engine when there is no water in the boiler and to pass the hot exhaust gases through the boiler. This is possible because of the protected construction of the Foster elements used as tubes in the boiler.

This waste heat boiler is an adaptation of the Foster economizer to diesel engine exhaust. The Foster economizer, which has for many years given excellent service in hundreds of steam generators in both stationary and marine power plants, is composed of seamless steel tubes upon which have been shrunk extended surface cast iron rings. The construction is rugged and compact, securing a far greater heat transfer per lineal foot of tube than any other form of heat absorbing surface capable of using gases of the same temperature.

To convert the economizer into a waste heat boiler it was necessary to add a drum to provide steam liberation surface and water storage. Part of the economizer surface was kept as such, maintaining the counterflow of gas and water; and the balance of the surface was connected to the drum. In addition to recovering waste heat, the economizer section, due to its low temperature, makes an effective spark extinguisher.

Cross section of waste heat boiler showing arrangement of drum, circulators, soot blower and economizer. The unit is simple and, due to the extended surface tubes, very compact.



When shop tests were conducted on the 4000-horsepower diesel engines at the Hooven, Owens, Rentschler Company's plant, one of the waste heat boilers was set up to receive the exhaust gases and the boiler performance was checked. The results of this test are given in the table reproduced herewith.

[Heat Engineering.]

Extension of Todd Yard at Mobile

TO meet the increasing demand for ship repair facilities in Mobile the Todd Shipyards Corporation has announced a very comprehensive extension and enlargement of the plant of its subsidiary, the Todd Shipbuilding and Dry Dock Company, Inc., the completion of which will give Mobile the largest and most modern ship repair plant on the Gulf. Property recently purchased, abutting the south side of the plant permits the extension of the present frontage on the Mobile River Channel by about 600 feet.

Plans and specifications for the improvement were prepared by Admiral Frederick H. Harris, consulting engineer to the corporation, and the actual work of dredging, and building bulkheads and piers is now under way. The principal work is dredging the area devoted to piers and ships to a minimum of 30 feet depth of water. The Alabama State Board dredge Alabama will take about three or four months to complete this work.

Doullut & Ewin, Inc., have been awarded the contract for construction of the steel sheet pile bulkhead and two piers and for the removal of old shipbuilding ways now on the site. These piers will be 600 and 700 feet long, respectively, and will provide two slips or basins, one 210 feet wide by about 650 feet long and the other 220 feet wide by about 800 feet long. Each pier will be constructed with a standard gauge railroad track running its full length and connection with shore tracks, which will be used for railroad cars and locomotive cranes handling machinery supplies and steel plates and shapes. Present shop facilities will be somewhat extended and will include a new coppersmith shop.

At the present time the plant at Mobile, besides having complete shop equipment, consisting of machine shop, plate shop, coppersmith shop, electric, wood working, and other ship repair facilities, has two floating dry-docks and is provided with berthing facilities capable of affording berths for two large ships and two small ships. The present plant is being pushed to capacity and by overcrowding and permitting ships to project beyond the pier head line into the channel, and to even lay outside the pier head line, has been able to take care of six ships in addition to any ships actually on the floating docks.

The extended plant will have ample berthing facilities for laying up ships while under repair and will accommodate eight of the largest vessels, and two smaller vessels, or six of the largest vessels and six smaller vessels, all this in addition to any ships actually on the floating dry-docks, affording ample facilities for taking care of the growing shipping of the Gulf that utilizes the Port of Mobile.

A Big Improvement in Gaskets

THE Flexitallic Gasket Company, Camden, New Jersey, announces that it now has a gasget that will take care of the most severe modern service conditions—high pressure, high temperature, and even acid conditions. Condensation in the lines has no effect, making it invaluable for plants carrying a variable load.

The improvement consists of a simple one-piece metallic armor which is spun around their well-known Flexitallic gasket. This not only makes a gasket that "looks" good, but is as good as it looks. It "makes a hit" wherever it is shown.

The old Flexitallic gasket itself is exceedingly strong in resisting pressure. Out of the many thousands of Flexitallic gaskets which have been installed all over the world not one has ever blown out. The gasket maintains its flexibility indefinitely. It is installed much more easily than any other gasket because it does not require as much tightening as others.

This excellent gasket is now being offered to the public encased in a one-piece metallic armor which makes the gasket still stronger, giving it an even greater factor of safety than was possessed by the original Flexitallic. Thorough tests were conducted on this new gasket in the laboratories of Tinius Olsen of Philadelphia. The tests prove that the original Flexitallic gasket possesses excellent elasticity up to its elastic limit. They prove that for regular service the old Flexitallic is amply strong. At no point in the tests was there any weakening or reduction in strength.

But the tests prove also that the armor clad Flexitallic gasket is even better. It is stronger. The elastic limit is higher. In fact, at the maximum capacity of the testing machine, 100,000 pounds, the elasticity of the gasket was not exceeded. This was equivalent to about 9000 pounds per square inch. It is doubtful whether such an extreme pressure as 9000 pounds per square inch will ever be required on any gasket, even where pressures in the pipe lines are as high as 1500 or even 3000 pounds per square inch. Industrial and power plants carrying pressures as high as even 1000 pounds per square inch are still very rare.

Trade Note

A company has been formed in Houston, Texas, under the name of **Rubshell Texas Inc.,** in order to exploit Rubshell paints and Holzapfel's heat-proof protective in the Texas and neighboring oil industry. This company is under the management of G. L. Holzapfel, who for many years has been occupied as research engineer in the oil industry.

The new company will also represent the **International Compositions Co.** of New York at the Port of Houston.

The Inland Waterways Corporation, Washington, D.C., has let contracts for steel barges as follows:

American Bridge Company, 24 barges, to cost $61,000 each.

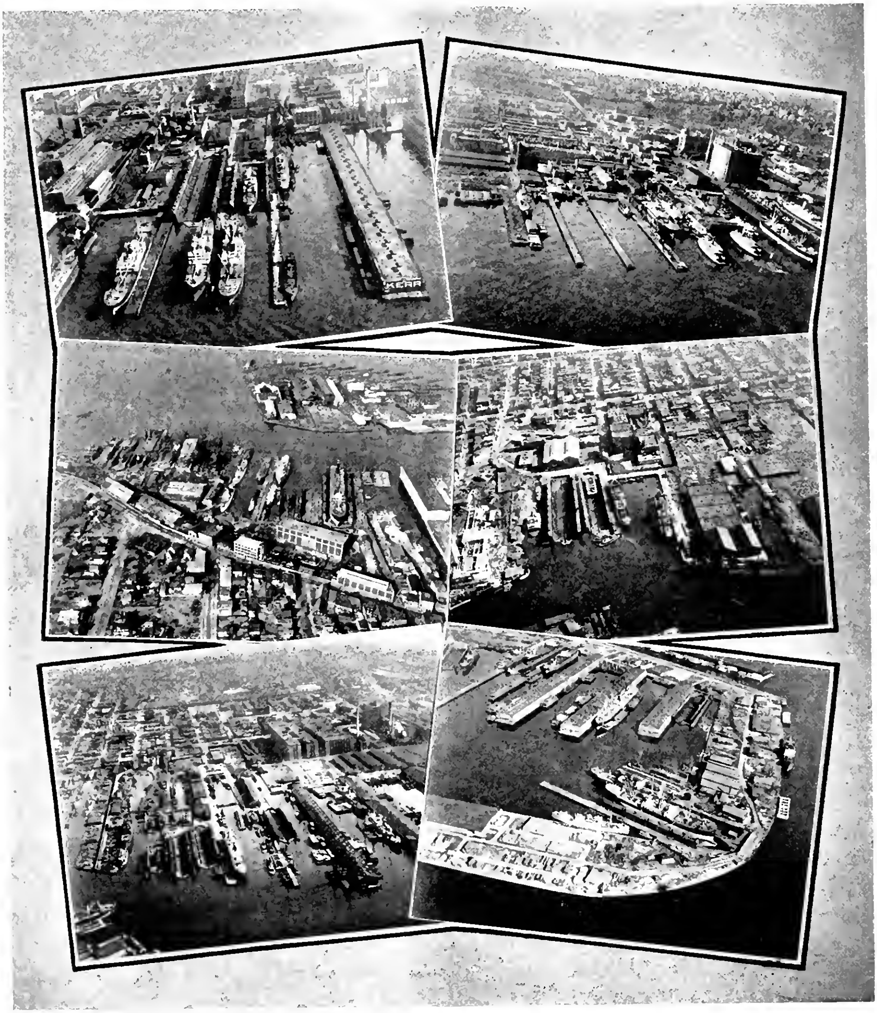
Riter Conley Mfg. Co., Pittsburg, Pa., 11 barges to cost $61,000 each.

Midland Barge Co., Midland, Pa., $61,000 each.

Other bids submitted were:

Charleston Dry Dock & Machinery Co., $107,675.44 each; Lancaster Iron Works, $100,224 each; Dravo Construction Co., $64,250 each for 20 barges, $65,250 each for 10 barges; Alabama Dry Dock & Steel Co., $71,946 each.

Gotham's New Dry-Dock Combination



The six plants shown above were consolidated March 1, 1929, into an operating organization to be officially named The United Dry Docks, Inc.

On the top line, left to right, we have the Morse Dry Dock & Repair Plant, Brooklyn, and the plant of the W. & A. Fletcher Co. At the left center is shown the Staten Island Shipbuilding Company, and at the right center the plant of the Alderton's dry-docks. The lower left shows the extensive plant of James Shewan & Son, Inc., and the lower right the Theodore Crane Sons Company.

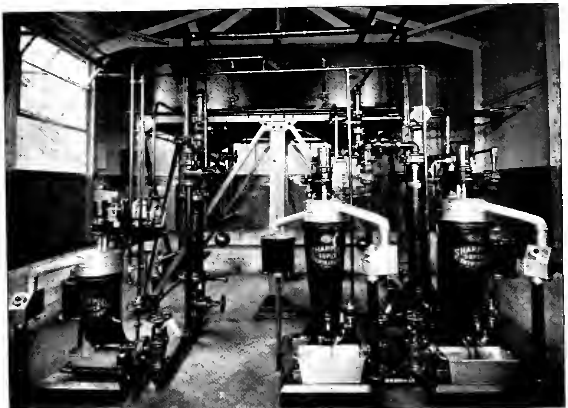
World's Largest Diesel-Electric Ferries Protected By Sharples Centrifuges

THE Southern Pacific Company and its associate the Northwestern Pacific Railroad operate on San Francisco Bay six large diesel-electric automobile and passenger ferryboats that are said to be the largest in the world using this method of propulsion. Each of these boats is of 2468 tons gross and has a capacity for 90 to 95 automobiles and is equipped with four 6-cylinder, 450-horsepower Nelseco diesel engines, or a total of 1800 horsepower to the ship. Each of these engines is direct-connected to an electric generator, and these in turn supply power to a pair of electric motors, one driving the bow propeller and the other the stern propeller. The boats have a sustained speed of 13 knots an hour.

Three of these vessels, the Fresno, the Stockton, and the Lake Tahoe, are operated normally on the route between the foot of Mission Street, San Francisco, and the city of Oakland, landing at the end of the Southern Pacific mole. The other three boats, the Redwood Empire, the Mendocino, and the Santa Rosa, are operated on the route from the foot of Mission Street, San Francisco, to the City of Sausalito. The former route is approximately an 18-minute run, about 3½ miles in length; the latter route is longer, with a run of approximately 28 minutes.

With 24 diesel engines and an aggregate of 144 cylinders in its floating equipment, the Southern Pacific Company was faced with the problem of maintaining these cylinders in good economic operating condition and, therefore, of supplying these cylinders with clean diesel fuel oil and clean lubricating oil. After considerable study, the engineers of the operating firm decided to establish a unit purifying plant on the Oakland Mole for the three diesel-electric ferries operating on that route, and to install individual units on each of the three vessels operating on the Sausalito run.

Sharples Super Centrifuges were chosen for both of these installations and have now been in satisfactory operation for over two years. We present herewith a reproduction of a good picture of the interior of the unit at the Oakland Mole. Diesel fuel oil is taken care of in this unit by two No.6 Sharples Super Centrifuges, and lubricating oil is handled by one No. 5-A Sharples lubricating oil Super Centrifuge.



The diesel fuel oil and lubricating oil purification plant located on the Oakland mole of Southern Pacific Company, servicing three diesel-electric automobile ferries each equipped with four Nelseco 450 diesel engines. At the right are two No. 6 Sharples super-centrifuges operating on 26-degree Baume diesel fuel oil at 120 to 140 degrees Fahrenheit. The small unit at the left is a No. 5-A Sharples super-centrifuge working on diesel lubricating oil.

Careful tests in this plant have shown that an average of one pound of mud, sand, and sludge is removed from each 20½ barrels of the highest grade of diesel fuel oil obtainable. Samples of the sludge have at various times been analyzed in laboratory tests, and, on the basis of these laboratory experiments, it is estimated that from every hundred barrels of oil there is removed about ½ pound of siliceous material, which, under the microscope and feel of the fingers, very much resembles carborundum and would certainly make a very good grinding material.

While it is not possible on the installations afloat to keep such careful records as are kept in this unit at the shore end of the Oakland-San Francisco route, nevertheless the indications point to the fact that a larger percentage of sludge is removed from the oil by the centrifuges on board ship. This percentage has reached as high as one pound of sludge to 4½ barrels of oil. It is stated by the Sharples engineers that the average of all Sharples installations tested shows one pound of sludge removed to 12½ barrels of diesel fuel oil. This percentage of solid material in diesel oil certainly shows the necessity for protecting the wearing surfaces of the engine against the wearing of this material.

Diesel fuel oil is supposed to be clean; but in the process of refining oils it is impossible to prevent varying amounts of mud, sand and water which are carried in suspension and mulsified with the oil and carried over in the distillation process. The oil has therefore a certain small percentage of impurities as distilled in refining. In various stages of its transportation from the refinery to the engine there are many chances for further contamination. Dirty tankers, dirty drums, leaking tank roofs, fouled pipe lines, and pumps all contribute small portions of the dirt, grit, mud, and water; so that the only safe way to handle fuel and lubricating oils for a diesel engine is to purify them as delivered to the engine.

World's Largest Hangar

THE United States airplane carriers Saratoga and Lexington—the two largest ships afloat—could rest, without their masts, side by side inside the airship hangar soon to be erected at the municipal airport at Akron, Ohio, and the Washington Monument and the Statue of Liberty, end to end, could lie alongside them and there still would be room. This immense hangar will be used by the Goodyear-Zeppelin Corporation in the construction of the first of two gigantic airships for the United States Navy. It will be 1200 feet long, 360 feet wide, and 200 feet high, and will cost $2,500,000.

Not only will this hangar be one of the largest buildings in the world, but it will be the largest building in the world without pillars or posts to hold it up. Its shape will be that of an enormous, elongated archway. It will have what is said to be the world's largest, single, unobstructed floor area — 343,000 square feet — large enough to house six miles of freight cars. This floor will have to be level, and will be made of wood on a special foundation.

One of the interesting features of the hangar will be the mammoth doors, two at each end. Each of these will weigh 800 tons—three times the weight of an average passenger locomotive—and will run on 40 wheels when opening or closing. In spite of the great weight, however, a child will be able to control the movement of the doors simply by pressing a button. Once started in either direction, they will automatically slow down and stop at the end of their travel.

The electric equipment for the movement and control of the doors is being built by the General Electric Company. Each door will be operated by an alternating-current motor having two ratings: either 200 horsepower, 600 revolutions per minute, or 100 horsepower, 300 revolutions per minute. Special electro-hydraulic brakes will be used to stop the movement, and special control devices in the form of limit switches, interlocking mechanisms, etc., will simplify the operation.

It is expected that a minimum of 600 men will be employed in the construction of the first dirigible, and it is estimated that three years may be consumed in completing it.

Cooper and Bessemer Combine

A NEW company, The Cooper-Bessemer Corporation, representing a combination of The C. & G. Cooper Company and The Bessemer Gas Engine Company, has been announced. E. J. Fithian, president of The Bessemer Gas Engine Company, will be chairman of the board and B. B. Williams, president of The C. & G. Cooper Company, will be president and general manager of the new corporation. The remaining officers will be chosen from the active executives of both companies.

There will be practically no change in the personnel of the sales and service organizations. In many cases the men have spent years of service and are considered specialists in their lines by the trade which they have served so long. It will not be the policy of the combined organizations to effect any economies by reducing the sales and service forces. Rather they will be increased at some points with the idea of offering the trade still better service.

This combination brings together two of the oldest manufacturers of power machinery in the country. The C. & G. Cooper Company was established ninety-six years ago at Mt. Vernon, Ohio, by two Cooper brothers and has had an unbroken but conservative growth ever since.

The Bessemer Gas Engine Company was organized at Grove City, Pennsylvania, more than thirty years ago. Its progressive policies have resulted in a rapid yet sound growth until today Bessemer gas and diesel engines are favorably known in every industry where internal combustion engines are used.

This is one of the most natural big business consolidations and should result in engineering and manufacturing economies from which power users will profit immediately. In the first place, the friendliest of competition has always existed between the two companies. Their policies of fair dealing to employees and to customers have been alike. The Cooper company has for a long time occupied an enviable position in the 4-cycle gas engine industry especially for compressor service. The Bessemer company has held an equally enviable position in the marine and stationary diesel engine and 2-cycle gas engine fields. Recently there has been a tendency for each to start developments in the other's well established lines. The inevitable result would have been completely parallel lines with increased manufacturing and sales costs in a field where competition has always held profits so low that modern research, improved engineering, and adequate field service have consequently been handicapped.

With the combined lines of engines and compressors already practically complete, it is expected that improvements in engineering and manufacturing can be carried out which will continue to keep the names Cooper and Bessemer among the leaders wherever internal combustion power can be used.

The combined lines will now include standardized sizes of gas and diesel engines and compressors ranging from 30 to 1,500 horsepower. The policy will be to make prices just as low as is possible; but high quality and field service will never be sacrificed to meet a price. Every Cooper and Bessemer product will be backed by a responsibility that for a long time has inspired confidence among users of gas and diesel engines and compressors.

The control station of a modern power cruiser—the Sterling engined cruiser Radiant.

Book Reviews

JURISDICTION IN MARGINAL SEAS (With Special Reference to Smuggling), by William E. Masterson. 420 pages, bound in red buckram with gold stampings. Copyrighted by the Bureau of International Research of Harvard University and Radcliff College. Published by The MacMillan Company. Price $5, net.

National and international law on the subject of legal control over coastal waters presents many problems to the diplomat and has become recently a topic of much correspondence between the United States and many of the world's maritime powers. In most countries there is a distinct and separate system of law relating to evasion of customs duties or the act of smuggling as disassociated from control for other purposes, such as fisheries, neutrality, public health, or navigation. The present work is primarily devoted to the law on smuggling. It represents a very considerable labor of research into sources, both in the United States and Europe.

The book deals with its subject in five main divisions:

I. The development of the English law.

II. The law of the British Empire.

III. The development of the law of the United States.

IV. Diplomatic correspondence, treaties, and arbitrations.

V. Conclusions.

In the analysis of the existing law on smuggling and its development through the last two hundred years, the book renders a distinct contribution to the literature on this very interesting and timely subject.

SAILING CRAFT. Edited by Edwin J. Schoettle. 786 pages, illustrated with many halftones, pen and ink sketches, and drawings; attractively bound in grey with gold stampings; published by The MacMillan Company. Price $12, net.

"The title of this book," says the editor's preface, "must be understood to have something of a double meaning." While the text is mainly composed of descriptions by experts of the various classes of racing and cruising sail boats of the present day, it also covers at some length the art (or craft) of sailing, and the principal waterways of America suitable for boating.

There are chapters covering such subjects as the aerodynamics of sails, ocean racing, classification of sailing craft, regatta committee work, salty talk, etc. Sir Thomas Lipton writes the chapter on International Racing. Sailboats of every description are presented both in the text picture and architect's drawings, from the sneak box and sailing canoe "up to the most ambitious sloop and schooner." In short this is the most complete American book on racing and sailing yachts yet published.

Pacific Coast yachtsmen will be especially interested to note two chapters, one on Southern California Yachting, by Edson B. Schock; and the other on Sailing at Seattle, by Ward Jones. Yachting on San Francisco Bay and at Portland are not mentioned, although both have much more experience in sailing craft than either of their northern or southern neighbors.

The editor's undertaking of this work "was prompted by" his "love of the sport of sailing and by his desire to present to many families in America the advantages of a family sail boat as a center of interest in keeping the family together in its recreational life." . . . "A small amount of money paid for a 15-foot boat for the children to sail in is the finest investment a man can make." Teaches the child "concentration and application" and gives him "mental training and self-reliance."

All lovers of a boat and the art of sailing and many land lubbers who have never seen a boat will enjoy the textual and pictorial features of this masterly compilation.

HYDRAULIC LABORATORY PRACTICE. Edited by John R. Freeman. 890 pages, profusely illustrated; bound in green cloth with gold stampings; published by The American Society of Mechanical Engineers, 29 W. 39th St., New York. Price $10.

This monumental work is a real labor of love, inspired by the splendid vision of an American engineer John Ripley Freeman and carried out with great nobility of purpose by many European and American scientists and engineers. The German edition, published in 1926, is fully translated, and much additional material on American Hydraulic Laboratory practice is included as well as notes on the theory of experiments with models.

The inspiration and scope of the book are perhaps best told by Conrad Matschoss, editor of the German edition:

"This volume, produced through the collaboration of prominent scholars, research workers, and engineers, owes its existence to a hydraulic engineer of the United States, John R. Freeman. Those who have the privilege of knowing him personally are aware of his technical knowledge, profound love for his profession, and pleasure in helping to make known the results of new researches by others.

Freeman, full of friendliest recognition for the scientific achievements observed by him in a number of hydraulic laboratories during his European tour of 1924, in the course of which he visited the laboratories in Berlin, Dresden, Brunn, Karlsruhe, and saw great problems of river and harbor hydraulics taken from out-of doors into the laboratory and solved by means of experiments upon scale models, evinced an ardent desire to place before the engineering world at large the facts which he had learned. He urged upon Professors Engels, de Thierry, Rehbock, Smrcek, and the undersigned that a comprehensive work be published in German and in English which would bear witness of what had been accomplished up to this time, and make clear to other researchers the precise mathematical relations which govern such experiments and the limitations of the methods of dynamical similarity in experimental hydraulics.

It was Freeman's belief that doing so would stimulate research elsewhere; that the experimental hydraulic laboratory, operated scientifically by means of small-scale models, would develop confidence in other countries, more especially in the United States; and that, thus, hydraulic engineering generally would be promoted for the benefit of all nations through comprehensively organized and scientific cooperation and friendly interchange of results.

The German Engineering Society gladly acted on the earnest suggestions made to it by its colleague from across the ocean and has carried on the undertaking with the cooperation of these highly esteemed research workers, from various nations of Europe, whose contributions are presented in the pages that follow; a cooperation that was cheerfully furnished at its request.

May gratitude to the collaborators and the hope that their work may promote international cooperative effort, so indispensable to the welfare of all nations, accompany this volume in its message to all friends of engineering, both young and old, throughout the world."

While there are some very illuminating notes on ship model experiments that will be of great interest to naval architects and shipbuilders, the bulk of this volume is occupied by description of laboratory and apparatus used in studying the effect of stream and tidal flow in connection with hydraulic structures, such as dams, bridges, piers, wharves, quays, weirs, etc. This part of the work is invaluable to engineers designing waterfront terminals and to those having charge of conservation and navigation in streams, harbors, canals, or channels.

BROWN'S RULE OF THE ROAD MANUAL. Revised by W. K. Stewart; 140 pages, fully illustrated; pocket size, bound in cardboard; published by Brown, Son & Ferguson, Ltd., 52 Darnley Street, Glasgow, Scotland. Price 2 6, net.

This interesting compilation has been a standard guide for British seamen to the Board of Trade examinations on the "Rule of the Road." The present edition has been revised and brought up to date by W. K. Stewart, head of the school of navigation, Dundee Technical College. While the book is typically British, the majority of the rules on which the text treats are international in their scope. The matter is presented in a clear, concise style, and the diagrams are excellent and compactly arranged, making an excellent pocket guide for yachtsmen, and small boat operators.

Sperry Gyros on the Great Lakes

ORDERS have been received by the Sperry Gyroscope Company, Inc., from Great Lakes ship operators, since the close of last season, for sixty-seven gyrocompass equipments. Forty-seven of this number will be installed prior to the opening of the season in the spring, and the remainder will be installed during the operating season.

When these equipments are installed there will be considerably over two hundred ships on the Great Lakes employing the Sperry gyro-compass. A number of Great Lakes vessels are also equipped with the Sperry gyro-pilot or automatic steering equipment.

Schools for the purpose of training officers of these ships in the operation and care of the gyrocompass have been conducted by the Sperry company this past winter at Duluth, Cleveland, and Buffalo. One hundred and forty-three men have completed the course given at these schools.

Why This Difference?

RECOGNITION of the universal value of the oxy-acetylene process in industry has advanced to the point where there is hardly a plant of any size that does not have at least one welding and cutting outfit. A survey of almost any industry will show, however, that there is still considerable variation in the extent to which the process is used even in plants that are comparable in every way.

In a certain industry, for example, one large company has approximately a hundred welding outfits while another company in the same territory and doing the same type of work has less than a dozen. Why this difference? It is logical to conclude that the first company is finding profitable use for all of its outfits or otherwise that number would not be maintained. If that is so, then the second organization is obviously not getting full advantage of the oxy-acetylene process as applied in its work.

The mere fact that a plant or shop has an oxwelding outfit does not necessarily mean that the process is being used to maximum advantage. In the instance cited, the second plant may have restricted its use of welding to routine repair or maintenance work while the first plant may have sensed the practical importance of the process as a production tool.

With the aid of welding and cutting outfits, standard steel plate and pipe become economical raw materials for the production of endless variety of equipment and parts. Full appreciation of the value of the welding equipment in production work will greatly increase its usefulness in any plant or shop.

ENGLISH COURTS SUSTAIN TODD

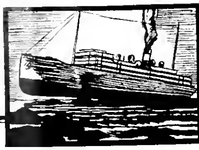
ADVICES received from London announce that the Todd Shipyards Corporation of New York has won the favorable decision of the English Courts, together with the costs of the action, in a suit brought by the White Patent Oil Burning Company, Ltd., for alleged infringements of certain patents granted to W. A. White.

These alleged infringements were based on the use of certain apparatus in connection with Howden forced draft furnace fronts, when these fronts had been converted for the use of oil burning apparatus, after having been used for burning coal on the grate.

It has been common practice to modify the Howden forced draft fronts in conversion jobs as well as in new construction, so that a so-called diaphragm plate could be used inside the furnace and adjacent to the Howden fronts. The Todd Shipyards Corporation have contended that the White patents concerning this feature were void because of the fact that this apparatus had been used at a time prior to the issuance of the patents to the White Company.

The decision of the English Courts has justified the contention of the Todd Shipyards Corporation and has declared White's patents invalid.

Jersey City, New Jersey. Reports are received from the Atlantic Coast to the effect that Jersey City recently passed ordinances providing for cooperation with the Pennsylvania Railroad in the construction of the world's finest waterfront terminal to include twelve 1000-foot piers. It is said that the American Export Line has agreed to lease two piers.



Marine Insurance

Edited by JAMES A. QUINBY

California Defines Marine Insurance

Legislature Extends Code Section to Include Inland Marine Coverage

IN March of this year Governor C. C. Young of California signed Assembly Bill No. 573, thus amending Section 2655 of the Civil Code of California. The code section formerly contained a very simple definition of marine insurance. In fact, it more or less limited the field of maritime coverage to insuring ship's cargo and other elements of ocean transit.

For some years there has been a constantly recurring dispute as to the increasing field of risks assumed by marine underwriters. Companies which have been chartered exclusively for underwriting fire hazards have viewed with alarm the steady encroachments which ocean insurers were making upon their domains. Auto truck hazards, jewelry risks, liability coverage, short term fire risks on goods in warehouses or during land transportation have all been covered by the marine policy.

This has naturally aroused bitter opposition in the ranks of the fire underwriters, who charge that such business is beyond the powers which the marine companies are granted in the various states in which they operate. The underlying reason for such bitterness is found in the fact that the fire companies, while they are at liberty to cover most of the additional risks at issue, must do so at certain prescribed rates which in the majority of cases are higher than the rates at which the marine companies are willing to quote. This situation is due in a large measure to the fact that fire insurance has become a standardized business, while marine insurance, with its multiplicity of varying hazards, is still in the competitive stage.

In the present amendment to the California Code, which has its counterpart in New York and the District of Columbia, the marine interests have apparently been successful in legalizing the extended scope of their operations. The new code section reads as follows:

Text of New Definition

"2655. The terms 'marine insurance' and 'marine business' and 'marine risks' shall mean insurance or reinsurance against any and all kinds of loss of or damage to:

(a) Vessels, craft, aircraft, cars, automobiles, and vehicles of every kind (excluding aircraft and automobiles operating under their own power or while in storage not incidental to transportation), as well as all goods, freights, cargoes, merchandise, effects, disbursements, profits, moneys, bullion, securities, choses in action, evidences of debt, valuable papers, bottomry and respondentia interests, and all other kinds of property and interests therein, in respect to, appertaining to, or in connection with any and all risks or perils of navigation, transit, or transportation, including war risks, on or under any seas or other waters, on land or in the air, or while being assembled, packed, crated, baled, compressed, or similarly prepared for shipment or while awaiting the same or during any delays, storage, transshipment, or reshipment incident thereto, including marine builder's risks, and all personal property floater risks including bailees' customers risks and risks commonly known as bundle insurance, and

(b) Person or to property in connection with or appertaining to a marine, inland marine, transit or transportation insurance, including liability for loss of or damage, arising out of or in connection with the construction, repair, operation, maintenance, or use of the subject-matter of such insurance (but not including life insurance or surety bonds); but, except as herein specified, shall not mean insurances against loss by reason of bodily injury to the person, and

(c) Precious stones, jewels, jewelry, gold, silver, and other precious metals, whether used in business or trade or otherwise and whether the same be in course of transportation or otherwise."

Sea-Water Damage

Enrique J. Hernando was a merchant of S. A.
Whose fertile brain evolved a plan to make insurance pay.
From the U.S.A. he bought himself some flour, C.I.F.,
And found a young surveyor with a conscience slightly deaf.
Now when the ship arrived in port, the flour was F.A.Q.
But Enrique had his bucket squad at work the whole night through
To furnish each and every sack a bath of H_2O.
It was sea-water damage,—his surveyor told him so.

But his claim when it went forward was N.G., and not O.K.
For the shipper had insured his bloomin' cargo F.P.A.

J.A.Q.

Cigarettes seem to be as dangerous on the water as in the woods. While tied up on the Detroit River for the winter two lake passenger vessels and a steam tug were burned to the water's edge, and an excursion vessel was badly damaged by fire started from a cigarette dropped by a rum runners lookout.

Marsh & McLennan-Davis Merger

NOT since the amalgamation of Johnson & Higgins and Wilcox, Peck & Hughes has the Pacific Coast marine world witnessed such a significant merger as that recently announced by the nationally known brokerage and insurance firms of Marsh & McLennan and J. B. F. Davis & Sons. The combined brokerage business of the two firms will be carried on under the name of Marsh & McLennan-J. B. F. Davis & Son with San Francisco offices occupying the entire second floor of the Adam Grant Building.

Marsh & McLennan has for years been one of the most powerful general brokerage concerns in the country with head offices at Chicago and branches in New York, San Francisco, Seattle, Los Angeles, Portland, Denver, Phoenix, Detroit, Buffalo, Duluth, Indianapolis, Minneapolis, Richmond, Virginia, Tulsa, Oklahoma, Columbus, Cleveland, Montreal, Vancouver, B.C., and Winnipeg. Their San Francisco office was opened in 1916 and served as a nucleus for expanding influence on the Pacific Coast.

The head office of J. B. F. Davis & Sons prior to the merger was at San Francisco with branch offices at Seattle and Los Angeles. The firm was founded by J. B. F. Davis over fifty years ago and has carried on the business thus founded under the later direction of Winfield S. Davis and Bert L. Davis. Recently Henry M. Hansen, manager of the casualty department, and James M. Ryan, manager of the fire department, were admitted to partnership.

The following officers will guide the destinies of the new firm:

D. R. McLennan, president; C. W. Seabury, vice-president and treasurer; E. C. F. Knowles, executive vice-president; W. S. Davis, vice-president; B. L. Davis, vice-president; E. B. DeGolia, vice-president; J. McC. Davis, vice-president; M. M. Levis, vice-president; H. M. Hansen, vice-president; J. M. Ryan, vice-president; and Miss A. M. Chase, secretary.

Another Viewpoint on Freight in General Average

(The conclusion in St. Paul vs. Pacific Freighters, reported in our last issue, is provoking criticism from some quarters. The following attack upon the somewhat revolutionary decision is written by Wilfred Page, of Geo. E. Billings Co., San Francisco.)

AS I think that few maritime men will concur in Mr. Quinby's remark that the decision in the case of the Rosamond, 1929 A.M.C. 107, clears up some of the opaque borden lines of general average, I venture to comment upon the decision.

I submit that it is a novel proposition that the holder of a bill of lading secures a vested interest in the vessel so as to be entitled to any part of her earnings. Except in the case of a time charter, amounting to a letting and hiring of the vessel, no such right passes to a charterer. The holder of a bill of lading is entitled only to have his cargo carried, the particular cargo originally shipped, and, if that cargo should be destroyed during the voyage, he is not entitled to substitute other cargo in its place. It is true that in this decision, the holder of the bill of lading was not given the right to substitute cargo but, apparently, the Court went further than that, requiring that the carrier credit the gross earning of the space, leaving the carrier out of pocket all expenses of earning it.

It is quite true that when, in general average, a shipowner is entitled to claim for freight sacrificed, he must offset his **net** earnings from cargo loaded in the place of that sacrificed. But, in the Rosamond case, the shipowner could make no claim for freight jettisoned, for the bill of lading contained the York-Antwerp Rules, which excluded claims for jettison of deck cargo. It has heretofore been recognized that the York-Antwerp rules are as binding upon the cargo owner as upon the shipowner and should have barred the claim made by the holder of the bill of lading.

An opinion being lacking, we must guess at the basis of the decision of the Court, and it may be the Court assumed that the new freight was the direct and natural consequence of the general average act. Perhaps the freight would never have been earned but for the general average act, but neither would it have been earned but for the expenditures made repairing the vessel, in seeking the new cargo, and the expenditure of good money and time in loading, stowing, carrying, and discharging it. Neither would the ship ever have earned a freight again, but for the general average act, and it is difficult to see why one could not, following such a theory to its logical conclusion, say that the holder of the bill of lading was an owner in the ship in perpetuity for the percentage indicated in the decision.

They do Move Around

Harry L. Stoddard, who some two years ago saddened his host of friends on California Street by moving to Los Angeles to take over the management of the marine department of the Automobile Insurance Company in that city, has returned to the Western Branch Office at San Francisco. During his former membership in the San Francisco marine fraternity he was a moving figure in the Marine Association banquets and was largely responsible for the establishment of the Study Class. It goes without saying that those of us who know Harry are glad to see him back, and look forward to a resumption of his activities both in a business and semi-social way.

The western branch office of the Automobile Insurance Company loses James W. Scanlon, former loss manager of the marine department, who has resigned to become marine department manager for W. D. Brandt & Company.

Mr. Stoddard's former position as the Los Angeles marine manager for the Automobile is assumed by F. C. Hutchinson, who comes to the organization from the general agency of Seylor-Day in Los Angeles. Mr. Hutchinson is also an ex-San Franciscan, having been formerly connected with the firm of Matthews & Livingston.

Court Retracts Unequal Collision Damages

THE case of Margaret-Manchester Merchant, reported in our issue for February of this year, allowing unequal measures of recovery in a collision case involving unequal degrees of fault, has been modified by the Circuit Court of Appeals for the Third Circuit so as to conform with the long established custom of allowing evenly divided damages in such cases (1929 A.M.C. 307). The court in its latest ruling comments as follows:

"Experiencing a growing doubt not as to its power to make the order apportioning damages but as to its conduct in not literally and respectfully following the moiety rule which the Supreme Court has from time to time applied, this court, of its own motion, called for a rehearing on the sole question of division of damages.

At the rehearing all doubts were dispelled by the thorough research made and assistance rendered by proctors for the several parties on a showing that, a few cases in lower courts to the contrary, the rule of the Supreme Court has been not to appraise different degrees of blame when injuries have resulted from mutual though unequal faults and apportion the loss accordingly, but to regard liability as mutual and to apportion the loss equally between the offending ships on the principle that damage by a common fault is a common loss. Beginning with the schooner Catherine, 58 U.S. 169, the first case which raised the question before that court, and running through a long line of cases, 11 Corpus Juris, 1200, et seq., from which the following may be selected at random, Atlas, 93 U.S. 302; North Star, 106 U.S. 17; Max Morris, 137 U.S. 1; Eugene F. Moran, 212 U.S. 466; White Oak Co. vs. Boston Canal Co., 258 U.S. 341, this court in its own research aided by the industry of proctors, has found no case in which the Supreme Court has departed, even by variation in exceptional circumstances, from its rule of equal liability for mutual faults and equal division of damages, adopted expressly as the best rule for distributing justice between mutual wrongdoers. The Max Morris, supra. Yielding to these authoritative pronouncements, this court, wholly aside from whatever views it may have on the subject, is constrained to follow the rule and in consequence change its decision to that of affirmance of the decree dividing the damages equally in the manner which the law prescribes. North Star, supra."

Mixed Cargo

Time was when the legal profession took pride in its emphasis upon the individual, but nowadays expansion seems to be the keynote of progress, even among admiralty firms. We have recently received an announcement of the opening of a London office by Single and Single, of New York, and now comes the establishment of a Los Angeles branch by McCutchen, Olney, Mannon & Greene, the largest law firm on the Pacific Coast.

The admiralty business of McCutchen's branch in the south will be handled by Harold Black, formerly of the San Francisco office. We hate to see Hal go to Los Angeles, because it's been such a pleasure to deal with him in San Francisco. One of these cards-on-the-table chaps, whether he's fighting or settling. (Advt.)

The Waterfront Safety Committee of San Francisco announced through Byron O. Pickard, engineer, that so far this year there had been only one fatality occurring on the San Francisco waterfront—that being the first in a six-months period. The Waterfront Safety campaign is being extended to Los Angeles and Portland.

All this talk of expansion brings to mind the story of two strangers who were paired off on the public links. After a mutually appraising glance, the following conversation took place:

"My name's Binks."

"Mine's McGoof. What business y' in?"

"Law."

"Well! So am I. Where's your office?"

"California Street."

"Well, Well. We're probably neighbors. What firm are you with?"

"McDuffer, Whiffem, Schnitzel, Duncan, Fyfe & Drumm."

"Shake—So am I."

By the way, have you heard that Wilfred Page of Geo. E. Billings Co., the Lord High Mogul of the Iron Hat and White Necktie, after numerous seasons of fair wind and far voyages, has at last slipped his anchors and brought up on the entangling shoals of matrimony? Yep, it's a fact! We offer our congratulations and all that sort of thing. The funny thing about it was the way the news became public on California Street.

It seems that Al Cupid of the Fireman's Fund Insurance Company was reclining in a hospital for the purpose of obtaining a divorce from his appendix and a friend from Santa Cruz sent him a clipping from the Santa Cruz paper containing an item of interest about a mutual friend. On the reverse side of the clipping was a notice of the issuance of a wedding license to the house of Page, containing various details including the ages of the respective parties, (send stamped addressed envelope).

There ought to be a good Ted Cook heading for an item like this. "Page Cupid" or something like that. At any rate, Cupid is now back on the job, and both he and Wilfred are reported to be recovering.

STUDY CLASS ACTIVITIES

The Study Class of the Marine Underwriters of San Francisco reached its high-water mark in attendance at the meeting of March 18, there being forty members present to hear Theron L. Prentiss of Marsh & McLennan and R. C. Robinson of F. F. G. Harper & Company.

Mr. Prentiss, a leading average adjuster of San Francisco, delivered a basic discussion outlining the proper method of adjusting particular average claims on cargo. He distinguished particular charges and salvage charges from particular average and further stressed the difference between a salvage basis of loss computation and the particular average basis which consists in ascertaining the percentage of depreciation upon gross landed values, and then applying this percentage to the insured value.

The second speaker, R. C. Robinson, explained what is a custom broker and his relation to oceanic shipments. As a background for his discussion, he gave a brief sketch of recent tariff laws with an explanation of how the various rates are applied. He explained the handling of damaged cargo, pointing out how the shipper, and indirectly the underwriter, was protected with respect to custom's charges on cargo damaged originating on voyages of importation to the United States as well as damage to cargo not discovered until after the arrival of the shipment in this country.

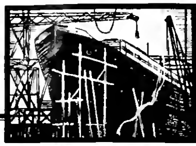
The increasing interest in the work of the Study Class was evidenced at the meeting of April 1 by an attendance of 55 members. The first half of the period was taken up by C. S. North, average adjuster for Johnson & Higgins of San Francisco, who discussed current general average problems. These problems were in the form of written questions submitted to Mr. North some days prior to the meeting. The questions covered the entire range of general average, from substituted expenses to contributing values of cargo, and were answered in a concise manner which recommends this type of procedure for further use.

The second speaker of the evening was David C. Young, chief surveyor for the Board of Marine Underwriters of San Francisco, whose ready wit and wide experience was employed to the full extent in an informal discussion of Hull Risks and Machinery Damage. Mr. Young dwelt particularly upon the distinctions between wooden and steel hulls and their susceptibility to distortion when on drydock. At the close of his talk, he was asked numerous questions, certain legal lights among members being interested in gas engines, the backing power of turbines, and kindred subjects.

And we have received an engraved favor dated April 15th announcing that Lillick, Olson & Graham, in conjunction with E. R. Young and H. R. Kelly, will conduct joint offices in the Rowan Building, Fifth and Spring Streets, Los Angeles, for the practice of admiralty law. We understand that Nip McHose of Lillick's office, who throws basketballs and libels with either hand, will be San Francisco's contribution to the new organization.

RAYMOND I. JONES,
Pacific Coast Manager for The New Jersey Asbestos Co.

Raymond I. Jones, one of the most active and popular marine supply officials on the West Coast, has been appointed to the Pacific Coast management of The New Jersey Asbestos Company, carrying on the business of Squire & Jones. Mr. Jones' offices in San Francisco are located at 37 Spear Street; and the Wilmington office is now 209 Avalon Boulevard.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Alaska Steamship Company to Build Large Passenger and Freight Vessel

Plans and specifications have been issued to shipyards on both coasts by the Alaska Steamship Company of Seattle for a fine new passenger and freight liner for the Puget Sound-Alaska service of this company.

The vessel is to be 420 feet long and is to have turbo-electric drive. It is reported that order for the propulsion plant has already been placed with Westinghouse Electric & Mfg. Co. Water-tube boilers are specified and 8000 horsepower. She will be fitted up to carry a large number of passengers and a goodly amount of freight and will have all the most modern equipment and furnishings for an excursion vessel.

Status of Matson and Dollar Projects

No official announcement has yet been made by the Dollar Steamship Company of San Francisco on the matter of awarding contracts for new transpacific passenger and freight liners. However, there has been a strong report to the effect that orders for four 620-foot liners to have turbo-electric drive have been placed with the Newport News Shipbuilding & Drydock Co. and the New York Shipbuilding Company, and these reports have not been denied by the company. Engineers and naval architects of these two firms have been in San Francisco for many months, and the details of the new liners are practically complete.

As we go to press no official statement has been made by the Matson Navigation Company as to the status of award of contract for two vessels for the Australia service of this company. Bethlehem's Fore River Plant was low bidder for the construction of the vessel. It is reported that some changes are being made in specifications and that the San Francisco plant of Bethlehem is working hard to get the order.

War Department Calls for Bids on Cruisers.

Construction contracts for five 10,000 ton cruisers authorized under the $274,000,000 naval construction program passed at the last session of Congress will be started shortly after July of this year.

Bids for two cruisers to be built by private shipyards will be opened by the Secretary of Navy Charles F. Adams on June 5. Estimates from the government navy yards for building three cruisers will be opened at the same time.

Cutters for Use in Philippines

The Bureau of Commerce and Industry of the Philippine Government at Manila has called for bids for the construction of two of the four new cutters which have been authorized for use in the waters in the vicinity of the Islands. Each cutter will cost approximately $125,000 complete with equipment. Further details may be obtained by addressing G. C. Howard, American Trade Commissioner at Manila, Philippine Islands.

Fisheries Patrol Boat for Alaska.

The U. S. Bureau of Fisheries, 1616 Smith Tower, Seattle, Washington, will open bids May 13 for the construction of a wooden fisheries patrol boat for the Seal Division for use at the Pribilof Islands in Bering Sea. The vessel will be of Douglas fir and Alaska yellow cedar construction, 130 feet long, 27 feet breadth, 17ft. 10ins. molded depth, and will be powered with a 400-horsepower 6-cylinder, directly reversible, Union diesel engine. Accommodations are to be provided for 32 white men and 24 natives.

Panama Pacific to Have Fleet of Six.

That the Panama Pacific Line of New York is to proceed immediately with plans for a fleet of six high speed, electric liners for the Coast to Coast service seems certain from a recent statement by Kirkwood H. Donavin, Pacific Coast operating manager of the line, that the company expects to have six 34,000-ton electric express liners by the summer of 1933. Two liners of this class, the California and Virginia, are now in service; the third, the Pennsylvania, will go into service next November, all three built by the Newport News Shipbuilding & Drydock Co.

Calmar Line to Build Freighters?

A rumor which insists on cropping up in spite of continued silence on the part of officials of the Bethlehem Steel Company and Bethlehem Shipbuilding Corporation is the report that the Calmar Line, a subsidiary of the Bethlehem Steel Company is planning the construction of four 14-knot cargo vessels for the intercoastal trade. The latest report is to the effect that two of these will be built at an Atlantic Coast plant of the Bethlehem Shipbuilding Corp. and two at the San Francisco Plant.

City of New York Plans Ferryboats

The Department of Plant and Structure of the City of New York, A. Goldman, Commissioner, has appropriated $1,275,000 for the construction of three additional ferryboats, and R. W. Morrell, naval architect, for the department is drawing up plans and specifications.

The first ferryboat for which bids will be asked will be similar to the Dongan Hills, just launched by the Staten Island Shipbuilding Co.; one will be similar to the Yorkville, launched March 28 by Todd Drydock, Engineering and Repair Works, Brooklyn; and the third is to be smaller, of about 100 feet length.

New Type Fish-Workboat

Specifications have been given out to the boat building yards at San Pedro and Wilmington, California, for the construction of a new type of fishing-workboat, which it is hoped by her designer will solve the problem of a type of boat that will meet the requirements of any branch of the fishing industry. The boat is to embody the features of a seagoing tug, purse seiner, offshore bait boat, and sardine fisherman.

She is to be about 85 feet long and will cost about $60,000.

The boat will be built by a syndicate under the direction of Charles I. Houghton, ship broker with offices at 111 West 7th Street, San Pedro, and Harry J. Summers. Anton Cosulich is the designer.

San Francisco Firm to Dieselize Freighter

Flood Brothers, 444 Market Street, San Francisco, have purchased from the Shipping Board the steamship George E. Weed for the sum of $20,000. In accordance with the purchasing agreement, the buyers agree to convert the vessel to diesel power within 18 months.

The George E. Weed is 400.7 feet long, 54.2 feet breadth, 30.4 feet depth, 5975 gross tons. She was built in 1920 at Chester, Penn.

Naval Architects Working on Plans for Super-Ships

The United States Lines, 45 Broadway, New York, have retained Theodore E. Ferris, well-known naval architect with offices at 30 Church Street, New York, to draw up plans and specifications for two high speed, de luxe passenger and freight liners as running mates to the Leviathan. The chief naval architects and marine engineers of three Atlantic Coast shipyards who will be bidders for construction of these vessels will form a joint committee with Mr. Ferris to prepare plans and specifications for the most suitable type of power plant and other equipment. The shipbuilding firms represented by their naval architects and engineers are the Newport News Shipbuilding & Drydock Co., New York Shipbuilding Co., and Bethlehem Shipbuilding Corp., Ltd. (See Page 135, April issue.)

It is reported that Cox & Stevens, Inc., naval architects at 347 Madison Avenue, New York, have asked for bids to be submitted by American yards for the construction of a 145-foot steam yacht.

Howard & Munro, 131 State Street, Boston, Mass., naval architects, have received bids for the construction of a 100-foot diesel-powered lighter for the Eastern Steamship Lines, Inc., of Boston.

It is reported from New York that naval architect Frederick P. Humphreys has drawn up plans and specifications for a diesel yacht to have a speed of 23½ knots.

Another large diesel powered yacht for an eastern owner is being designed by Benjamin T. Dobson, of New Bedford, Mass.

Sudden & Christenson, San Francisco, have purchased the steamers West Bridge and West Wauneke from the Shipping Board for $57,000 and $73,000 respectively. It is reported that each vessel will be re-engined at a cost to exceed $100,000. The present turbines will be removed and reciprocating steam engines installed.

SOME RECENT SHIPBUILDING ORDERS

American Bridge Company, Pittsburgh, Pa., is building six barges for its Erector Department, 175 x 26 x 11 ft.

Bath Iron Works, Bath, Maine, has an order for two trawlers for the Bay State Fishing Co., of Boston, Bath Iron Works design, to be 132 ft. 4 in. over-all, 24 ft. beam, 13 ft. depth, powered with 500-600 B.H.P. Winton diesel engines. The trawlers will be named Ebb and Flow.

Bethlehem Shipbuilding Corp., Ltd., Union Plant, San Pedro Works, has an order for a steel towing barge for the Shell Co., to be 131 ft.

TRIPLE LAUNCHING AT BETHLEHEM

On this page are shown three vessels launched recently by Bethlehem Shipbuilding Corp., San Francisco.

These are a pineapple barge, a tugboat, and a passenger and freight steamer for the Inter-Island Navigation Company of Honolulu.

The steamer Hualalai is a sister ship to the Waialeale, completed last year, and is 310 feet long, 48 feet beam, 27.6 feet depth, powered by 4000 shaft horsepower Westinghouse turbines.

The Eleu is a twin-screw diesel tug, 117 feet over-all, 28 feet breadth, and 16 depth.

L.O.A.; 40 ft. beam; 9 ft. 6 in. loaded draft.

Dravo Contracting Co., Pittsburgh, Pa., has an order from the Arundel Corp. of Baltimore for ten steel sand and gravel barges 130 x 34 x 8 ft. 9 in.; also an order from the Island Creek Coal Co., Huntington, W. Va., for six steel hopper type coal barges.

Consolidated Shipbuilding Co., Morris Heights, New York, has an order for a 66-ft. day cruiser from G. B. Hoppin, to be powered with two 170-H.P. Speedway engines.

Midland Barge Co., Midland, Pa., has the following orders: For the U.S. Engineers, Louisville, Ky., 8 steel pontoons, 40 x 18 x 2 ft. 6 in.; for the Wheeling Steel Corp., Wheeling, W. Va., 2 steel barges, 100 x 26 x 8 ft.; for M. H. Treadwell Co., New York, a steel derrick hull, 84 x 33 x 7 ft. 6 in; two steel barges 50 x 16 x 5 ft. 6 in.

Nashville Bridge Co., Nashville, Tenn., has booked orders for a drydock, 42 x 36 x 5 ft.; three deck barges, 100 x 26 x 6 ft. 6 in.; one towboat, 56 x 14 x 5 ft. 6 in.

The Pusey & Jones Corp., Wilmington, Del., has an order from Cox and Stevens, Inc., New York, for a twin screw diesel yacht, owner not named, to be 168′ 9″ long by 28 ft. beam; and powered by two diesel engines of 500 B.H.P. each.

Sun Shipbuilding Co., Chester, Pa., has an order for a single screw, diesel tanker for the Sun Oil Company of 13,400 D.W.T., keel to be laid May 27.

Bethlehem Shipbuilding Corp., Ltd., Baltimore, Maryland, has an order from the Western Maryland Railway for a steel three-track carfloat to be 325 x 38 ft. 6 in. x 10 ft. 8 in.

Bethlehem Shipbuilding Corp., Ltd., Fore River Plant, Quincy, Mass., has an order from the Gulf Refining Co., Pittsburgh, Pa., for a 255-ft. oil barge.

George Lawley & Son Corporation, Neponset, Mass., has a contract from Henry J. Gielow, Inc., 25 West 43rd Street, New York, for a diesel powered steel yacht for Edsel Ford, president of the Ford Motor Company, Detroit. The yacht is to be 130 ft. over-all, 23 ft. beam, 7 ft. 6 in. draft, and is to have two 300-horsepower diesel engines.

Bellingham Marine Railway Co., Bellingham, Wn., is building a ferryboat to cost $6800, to be powered with a 3-cylinder diesel engine to cost $7000; scheduled for June delivery.

Repair Awards

Todd Dry Docks, Inc., Seattle, Wash., has contract for repairs to the Isthmian Line steamer A. L. Kent, which grounded near Englewood, British Columbia. Sixty plates will be removed and repaired and cost of work will be about $80,000.

The following contracts for ship repairs were awarded to **United Dry Docks, Incorporated**, New York, on April 3 and 4.

Repairs to the Shipping Board steamship Oakspring at the price of $5237. Todd Shipyards Corp. was next lowest bidder at $6136.75. The work will probably be done at the Alderton Plant of the Company.

Contract for general repairs to the Shipping Board steamship Tomalva, at the price of $1930. Other bidders were Atlantic Basin Iron Works, $1978; Tickle Engineering Works, $2665; Tietjen & Lang, $2790.

The Shipping Board steamship Bangu will be repaired, contract having been awarded at the price of $2867.

Moore & McCormack Co. have awarded contract for repairs to their steamship Commercial Trader, at the price of $1934. Other bidders were Richmond Engineering and Boiler Co., $2025; Tickle Engineering Works, $2048; Atlantic Basin Iron Works, $2281; Capstaff Hunter & Co., $2460, and Robins Dry Docks, $2590.

The Robins Plant of the **Todd Shipyards Corporation** was low bidder recently for extensive repair work on the steamship Edith, which ran aground off San Juan, P.R., during a gale last winter. Bids submitted for the repairs were: Todd Shipyards Corporation, $86,510 and

Yarrows, Ltd., of Esquimalt, have been awarded the contract for repairs to the freighter Griffco, which on March 19 last grounded on Fraser Point, near Ladysmith, B. C. Renewal of six plates and other minor work constitute the contract to be handled by Yarrows. The cost of the contract will be approximately $14,000.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of April 1, 1929

Pacific Coast

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133′3″ length over-all; 30′ beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28 est.

Hull No. 113, lightship, sister to above; keel Sept. 1/28 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BALLARD MARINE RAILWAY COMPANY,
Seattle, Washington

Mikimiki, hull J 91, tugboat for Young Brothers, Ltd., Honolulu; 115 L.B.P.; 28 beam; 12 draft; 11 knots speed; 1040 Fairbanks-Morse diesel engs.; keel Sept. 12/28; launched Jan. 15/29; **delivered Apr. 1/29.**

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT
Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Hualalai, hull 5336, passenger and freight steamer for Inter-Island Steam Navigation Co., Honolulu; 295 L.B.P.; 27′6″ beam; 17′6″ loaded draft; 15 knots speed; 1200 D.W.T.; steam turbines; 4000 S.H.P.; 4 W.T. boilers, keel Dec. 17/28; **launched** Mar. 23/29; deliver June 1/29 est.

Humuula, hull 5338, steel passenger and freight steamer for Inter-Island Steam Navigation Company, Honolulu, 1100 Gr. tons; **keel Apr. 1/29.**

Eleu, hull 5339, twin screw diesel tug for Inter-Island Steam Navigation Co., Honolulu; 117 L.O.A.; 28 breadth, 16 depth; keel Jan. 28/29; **launched Mar. 21/29.**

Hull 5340, barge for Inter-Island Steam Nav. Co., Honolulu; **launched Mar. 21/29.**

Hull 5341, barge for Martin Ship Service, San Francisco; launched Jan. 8/29; **delivered Apr. 6/29.**

Not named, hull 5342, steel tow barge for Shell Co., Los Angeles; 131 L.O.A.; 40 beam; 9′6″ draft; 1000 gr. tons.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A. Wanner.

Hull 19, tow barge for Standard Oil Co. (Calif.), San Francisco; 72 L.B.P.; 24′ beam; 4′ loaded draft; 100 D.W.T.

Not named, hull 20, fishing boat for A. Paladini, Inc., San Francisco; 65′ L.O.A.; 16 beam; 6 loaded draft; 125 H.P. 5-cyl. Union diesel eng.; keel Oct. 19/28.

J. C. JOHNSON'S SHIPYARD
Port Blakley, Wash.

Cannery tender for P. E. Harris & Co., Seattle; 76 ft. long; **launched Mar. 25; delivered Mar. 27/29.**

Scow for Pioneer Sand & Gravel Co., Seattle; 130x38x11 ft.; **launched Mar. 4/29; delivered Mar. 6/29.**

Two fish scows for P. E. Harris & Co., Seattle; 60 x 16 ft.; **H-5 launched and delivered Feb. 21/29; H-6 launched Mar. 1, delivered Mar. 30/29.**

One K-D. scow for Northwestern Fisheries Co., Seattle; 65 x 22 ft.

LAKE WASHINGTON SHIPYARDS,
Houghton, Wn.

Purchasing Agent: A. R. Van Sant.

Foshay, hull 107, steel passenger and

freight motorship for Northland Transportation Co., Seattle; 186x35 ft. beam; two 550-H.P. Washington-Estep diesel engs.: keel Mar. 4/29.

THE MOORE DRY DOCK CO.
Oakland, California.

Purchasing Agent: N. Levy.

Coronado, one steel, screw double-ended diesel-electric automobile ferryboat for San Diego and Coronado Ferry Co.; 190 L.O.A.; 43'6" breadth of hull at deck; 60' breadth over guards; 14'9" depth at sides, molded; 8'11" light draft, molded; keel Dec. 27/28: launched Mar. 7/29; deliver Apr. 20/29 est.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

Purchasing Agent: C. C. Labric.

One steel car barge for Canadian National Railways, Vancouver, B.C.; 270 x 42 x 12' depth; keel Sept. 12/28; launched Dec. 27/28; **delivered Mar. 15/29.**

Copello I., hull 27, halibut fishing boat for Dan Larsen; 52 L.B.P.; 13 beam; 5'6" loaded draft; 50 B.H.P. Bolinder semi-diesel engs.: keel Jan. 9/29; **launched Mar. 25/29; delivered Apr. 3/29.**

Not named, hull 28, fish packer for Canadian Fish & Cold Storage Co., Prince Rupert, B.C.; 67 L.O.A.: 16'6" beam; 8'8" depth; 50 D.W.T.: 60 B.H.P. Fairbanks-Morse C.O. eng.; **keel Mar. 15/29.**

Ispaco I, hull 29, pilchard seine boat for Island Packing Co., Victoria, B.C.; 65 L.O.A.; 17'5" beam; 7'8" depth; 75-H.P. Atlas-Imperial diesel eng.: **keel Mar. 15/29.**

Ispaco II, hull 30, sister to above; keel Mar. 15/29 est.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 13/31 est.

Atlantic. Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Eight coal barges for West Kentucky Coal Co.; 175 x 26 x 11 ft.; **4 delivered in March.**

Twenty decked barges for U.S. Engineers, Rock Island; 108 x 24 x 5 ft.

Six barges for Erector Dept.; 175 x 26 x 11 ft.

AMERICAN SHIP BUILDING CO.,
Lorain, Ohio

Purchasing Agent: C. H. Hirsching.

Not named, hull 804, bulk cargo vessel for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12½ mi. speed; T.E. eng. 2200 I.H.P.; 3 Scotch boilers, 14 x 12 ft.; keel Mar. 25/29 est.; launch June 8/29 est.; deliver July 29/29 est.

Not named, hull 805, sister to above: keel Mar. 4/29 est.; launch May 18/29 est.; deliver June 22/29 est.

BATH IRON WORKS
Bath, Maine

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer; keel Dec. 3/28; launch Apr. 10/29 est.; deliver May 1/29 est.

Hi-Es-Maro, hull 123, twin screw steel diesel yacht, Henry J. Gielow, Inc., New York, designer; 266'x35'x22' depth; 14'6" draft; two 1200 B.H.P. Bessemer diesel engs.; keel Nov. 14/28; launch May 8/29 est; deliver July 15/29 est.

Corsair, hull 124, twin screw steel steam turbo-electric yacht; 343x42x27ft., 18 ft. draft; 6000 S.H.P.; General Electric turbo-generators; Babcock & Wilcox boilers; keel May 20/29 est.

Not named, hull 125, steel utility boat for Brown Co.: 36ft. long; 40 H.P. Bolinder eng.; keel Feb. 28/29; **delivered Mar. 23/29.**

Ebb, hull 126, fishing trawler for Bay State Fishing Co., Boston, Mass., Bath Iron Works design, 132'4" L.O.A.; 121'6" L.W.L.; 24 beam; 13 depth; 500-600 B.H.P. Winton diesel engs.

Flow, hull 127, sister to above.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Not named, Hull 1422, single-screw coal collier for Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Not named, hull H-1424, steel passenger and freight steamer for New England Steamship Co., 1800 gro. tons.

Hull 1425, steel coasting vessel for Seaboard Shipping Co.; 450 gr. tons.

BETHLEHEM SHIPBUILDING CORP., LTD.,
Baltimore, Md.

Hull 4240, steel 3-track carfloat for Western Maryland Railway; 325 x 38'6" x 10'8".

Hull 4241, same as above.

Hull 4242, same as above.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; Winton engs.; General Electric generators and motors; keel Jan. 30/29 ; launch July 1/29 est.

No. 116, same as above; keel Feb. 6/29; launch Sept. 1/29 est

No. 117, same as above; keel May 1/29; launch Dec 1/29 est.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2921, 106-ft. cruiser for L. M. Wainwright, Indianapolis; 2 Speedway diesels, 300 H.P. ea. at 700 r.p.m., wt. 7500 lbs.; deliver May/29 est.

Hull 2923, 66-ft. cruiser for J. McMillan, Detroit, Mich.; 2 170-H.P. Speedway engs.; deliver May /29 est.

Not named, hull 2925, 64-ft. cruiser for Rear Admiral L. M. Josepthals, New York; 2 170-H.P. Speedway engs.; deliver May/29 est.

Not named, hull 2927, 35-ft. fishing boat for Leon Goodman, Philadelphia; two 44-H.P. Speedway engs.; deliver June 1/29 est.

Hull 1929, 16-ft. yacht tender for Arthur Wheeler, New York, 1 Universal eng.

Not named, hull 2930, 106-ft. cruiser for W. C. Robinson, Pittsburgh; 2 Speedway diesel engs.; deliver May 15/29 est.

Hull 2931, 16-ft. yacht tender for above; 1 Universal eng.

Not named, hull 2932, 50-ft. fishing boat for Caleb S. Bragg, New York; 2 170-H.P. Speedway engs.

Not named, hull 2935, 35-ft., runabout for R. H. Gallatin; 170 H.P. Speedway eng.; deliver May 1/29 est.

Not named, hull 2936, 75ft. commuter boat for B. H. Borden; 2 300-H.P. Speedway engs.; deliver June 1/29 est.

Not named, hull 2937, 66ft. day cruiser for H. Murray; 2 170 H.P. Speedway engs.; deliver Aug. 1/29 est.

Not named, hull 3938, 66-ft. day cruiser for G. B. Hoppin: 2 170-H.P. Speedway engs.; deliver July 1/29 est.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Yoreda, hull 131, steel yacht, for Aaron De Roy, Detroit; 105 L.B.P.; 17 beam; 6 loaded draft; 14 mil. loaded speed; 110 D.W.T.; 250 H.P. diesel eng.; keel Aug. 1/28; launch May 1/29 est.; deliver June 1/29 est.

Bonny II., hull 132, wood yacht for C. W. Bonbright, Flint, Mich.; 61 L.B.P.; 13 beam; 4 loaded draft; 18 m.p.h.; 300 I.H.P. gas eng.; keel Oct 15/28; launch Apr. 15/29 est.; deliver May 1/29 est.

Olive K., hull 133, steel yacht for C. F. Kettering, Detroit; 169 L.B.P.; 26 beam; 12 loaded draft; 15 knots speed; 600 D.W.T.; 1000 I.H.P. diesel engs.; keel Jan. 15/29; launch July 1/29 est.; deliver Aug. 15/29 est.

Verona J, hull 134, wood yacht for Albert A. Rose, Detroit; 75'6" I.H.P.; 14'6" beam; 14' loaded draft; 18 M.P.H.; 70 D.W.T.; 500 H.P. gas eng.; keel Jan. 5/29; launch and deliver May 1/29 est.

Robark, hull 135, wood yacht for K. T. Keller, Detroit; 83 L.B.P.; 15'6" beam; 4'6" loaded draft; 14 M.P.H. speed; 82 D.W.T.; 300 H.P. Winton diesel engs.; keel Feb. 15/29: launch June 1/29 est.; delivery July 1/29 est.

Not named, hull 136, steel yacht for A. V. Davis, New York; 138'6" L.B.P.; 18 beam; 5 loaded draft; 20 M.P.H.; 150 D.W.T.; 1400 I.H.P. diesel engs.; keel May 1/29 est: launch Oct. 1/29 est.; deliver Apr. 15/30 est.

Not named, hull 137, steel yacht for M. H. Alworth, Duluth; 135 L.B.P.; 22 beam; 6'9" draft; 14 M.P.H.; 175 D.W.T.; 600 I.H.P. diesel engs.; keel Apr. 15/29 est.; launch Sept. 1/29 est.; deliver Nov. 1/29 est.

DRAVO CONTRACTING COMPANY,
Pittsburg, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'6" x 26'6" x 5' 6".

Hulls 795-799 inc.; 5 standard barges for stock; 130x30x7'6"; **3 delivered.**

Talcott, hull 810, steel hull dredge for U.S. Engineers Office, Washington, D.C.; 620 gr. tons.

Hulls 811-815 inc.; five steel dump scows for American Dredging Co., Philadelphia; 112 x 34 x 12 ft.

Hull 816, steel oil barge for American Dredging Co., Philadelphia; 100 x 34 x 10'3".

Hull 817, one welded steel barge for stock; 100 x 26 x 6'6".

Hulls 821 to 825 inc.; 5 deck scows for New York Central R.R.; 100'x33'8"x9'7".

Hulls 826 to 827 incl.; 2 1500-cu. yd.

dump scows for Geo. H. Breymann & Bros., New York.

Hulls 828 to 857 incl., 30 steel deck barges for Bank of Pittsburgh, Trustee; 125 x26x5'6".

Hulls 858 to 876 incl., 19 standard M.R.C. type steel barges for U.S. Engineers' Office, Memphis.

Hulls 877 to 882 incl., 6 standard M R.C. type steel barges for U.S. Engineers' Office, Memphis.

Hulls 883-892 incl., 10 steel sand and gravel barges for Arundal Corp., Baltimore; 130 x 34 x 8'9".

Hulls 893 to 898 incl., six steel hopper type coal barges for Island Creek Coal Co., Huntington, W. Va.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 105, oil barge for Oil Tank Corp.: 146x34'8"x10'2¼" (welded barge): keel Nov. 1/28; **launched Mar. 30/29;** deliver Apr. 6/29 est.

Hull 107, welded steel barge for Boston Molasses Co.; 60x20'4¾"x7'6"; launched Jan. 29/29; **delivered Mar. 1/29.**

Hull 108, same as above; keel Jan. 31/29; launched Feb. 22/29; **delivered Mar. 1/29.**

Hull 109, dredge hull for Gahagan Const. Co., 160 x 40 x 13'6"; **keel Mar. 13/29.**

GREAT LAKES ENGINEERING WORKS,
River Rouge, Michigan

Not named, hull 269, bulk freighter for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12 mi. speed; 12,000 gr. tons; TE engs. 2250 I.H.P. 2 W.T. boilers; **keel Mar. 14/29;** launch June 15/29 est.; delivery Aug. 1/29 est.

Hull 270, steel motor boat for U. S. Gypsum Co., Chicago; 30'6" x 6' beam; 65 H.P. gas eng.; **delivered Apr. 5/29.**

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1659, steam towboat for Wheeling Steel Corp.; keel Jan. 10/29; launched Feb. 26/29; **delivered Mar. 30/29.**

Hull 1660, lighthouse tender for U.S. Bureau of Lighthouses; 100x30x5'; **keel Mar. 11/29.**

Hull 1661, track barge for Yourtel-Robets Sand Co., Chester, Ill.; 195x30x6'6".

Hulls 1662-1665, four combination cargo and oil barges for American Barge Line Co., Louisville, Ky.; 150x35x11'.

Hull 1666, steel hull for towboat for Walter G. Hougland, Bowling Green, Ky.; 86x22'x42".

Hulls 1667-1671, five steel motorboats for U.S. Engineers, Vicksburg, Miss.; 30 x 7'6"x2'6".

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 244, diesel-electric dipper dredge for Great Lakes Dredge & Dock Co., 156 L.B.P.; 43 beam; 10 ft. draft aft; keel Aug. 30/28; launched Dec. 18/28; deliver June 1/29 est.

Pere Marquette 31, hull 246, car ferry for Pere Marquette Rail; Co.; 368 L.B.P. 57 beam; 17 loaded draft; 18 m. speed; **2 turbines;** 3600 I.H.P. each; 4 Babcock & Wilcox W.T. boilers; **keel Mar. 4/29;** launch July /29 est.

Pere Marquette 32, hull 247, car ferry, sister to above; keel May 1/29 est.

Not named, hull 248, steel yacht, owner not named; 78 long; 15 beam; 8'9" depth; 6' draft; 150 H.P. Fairbanks-Morse eng.

MIDLAND BARGE COMPANY
Midland, Pa.

Eight steel pontoons for U. S. Engineers, Louisville, Ky.; 40 x 18 x 2'6".

Two steel barges for Wheeling Steel Corp., Wheeling, W. Va.; 100 x 26 x 8 ft.

One steel derrick hull for M. H. Treadwell Co., New York; 84 x 33 x 7'6".

Two steel barges for M. H. Treadwell, New York; 50 x 16 x 5'6".

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Fernie, hull 23, single screw package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42'9" beam; 14' loaded draft; 12 mi. speed; 2200 D.W.T.; TE steam engs.; 1300 I.H.P.; 2 Scotch boilers, 14'6" dia. x 11' long; keel Dec. 4/28; launched Feb. 28/29; deliver May 1/29 est.

Not named, hull 24, bulk freighter for Canada Steamship Lines, Ltd., Montreal; 582 L.B.P.; 60 beam; 20 loaded draft; 11 knots speed; 12,000 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 Scotch boilers; 15'3" dia x 11'6" lg.; keel Apr. 11/29 est.

Midland Prince, converted to self-unloader; deliver May 1/29 est.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Hull 149, towboat for Standard Unit Nav. Co.; 92x24x5 ft.; keel May 10/28; launched Feb. 1/29.

Hull 161, ferry hull for stock; 150 L. B.P.; 62 beam; 8 loaded draft; keel Sept. 16/28; launched Feb. 10/29; **delivered Mar. 15/29.**

W. W. Fischer, hull 169, diesel towboat for Central Sand Co.; 120x26x5½ ft.; 720 I.H.P.; Fairbanks-Morse diesel; keel Feb. 15/29; launch June 1/29 est.

Hull 170, deck barge, 110x28x7¼ ft.; keel Dec. 7/28; launched; **delivered March 10/29.**

Hull 171, deck barge, 100x24x5 ft.; keel Dec. 12/28; **delivered Mar. 10/29.**

Hull 172, same as above; **delivered Mar. 10/29.**

Hull 173, deck barge, 100x26x6½ ft.; keel Dec. 18/28; **delivered March 10/29.**

Hull 175, ferryboat, for Cheatham Co., Tenn.; gas. eng.; 60x18x2¼ ft.; keel Jan. 2/29.

Hull 176, barge, 100x26x6½ ft.; keel Dec. 20/28.

Hull 177, tug, owner not named; Fairbanks-Morse diesel eng.; 50x12 ft.; 150 H.P.

Hull 178, dredge, 100x36x8 ft.

Hulls 179-183 inc., 5 barges, 120x30x

7 ft.

Hull 184, deck barge; 180 x 40 x 9½ ft.; keel Feb. 12/29.

Hull 185, deck barge; 180 x 40 x 9½ ft.; keel Feb. 21/29.

Hull 186, deck barge; 180 x 40 x 9½ ft.; keel Mar. 7/29.

Hull 187, deck barge, 110 x 32 x 7¼ ft.; **keel Apr. 6/29.**

Hulls 188-189, two deck barges for stock; 100x24x5 ft.; **keels Mar. 21-28/29.**

Hulls 190-191, two deck barges for stock; 75x20x5 ft.; **keels Apr. 3-7/29.**

Hull 192, deck barge for stock; 120 x 30x6 ft.; **keel Apr. 2/29.**

Hull 193, deck barge for stock; 110 x 28 x 7¼ ft.; keel Apr. 12/29 est.

Hulls 194-195, 2 deck barges for stock; 100 x 24 x 5 ft.

Hull 196, drydock, 42 x 36 x 5 ft.

Hulls 197-199 inc., three deck barges; 100 x 26 x 6½ ft.

Hull 200, towboat, owner not named; 56 x 14 x 5'6".

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Viking, hull 328, steel yacht for Geo. F. Baker, Jr., 272'1" L.O.A.; 36'6¾" beam; 18'6" depth; two turbine driven G.E. motors; 2 Babcock & Wilcox WT boilers; 1200 gross tons; 2600 S.H.P.; keel July 3/28; launched Dec. 15/28; deliver Apr. /29 est.

Pennsylvania, hull 329, 18 - knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Oct. 15/28; launch July /29 est.

City of Elwood, hull 331, diesel conversion for U.S. Shipping Board.

Ward, hull 332, diesel conversion for U.S. Shipping Board.

President Harrison, hull 333, reconditioning for Dollar Steamship Co., San Francisco.

Hulls 335-336, two house barges for Chesapeake and Ohio Railway Co.; **keels Mar. 11/29.**

Not named, hull 337, passenger liner for A.G.W.I. Nav. Co., New York; 508 x 70'9" x 39'; 15,380 tons displ.; 16,000 S.H.P.; 20 knots speed; turbo-elec. drive; keel Aug./29 est.

Not named, hull 338, sister to above; keel Sept. /29 est.

NEW YORK SHIPBUILDING CO.
Camden, N. J.

Purchasing Agent: J. W. Meeker.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; launched Jan. 23/29; deliver July 9/29 est.

Chester, light cruiser CL- 27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.

Santa Clara, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'9" beam; 37'5" depth; General Electric turbo-electric machinery; keel Feb. 4/29; launch Sept./29 est.; deliver Apr./30 est.

THE PUSEY & JONES CORP.,
Wilmington, Del.

Purchasing Agent: James Bradford.

Acania, hull 1038, twin screw diesel yacht for Arthur E. Wheeler, New York; 126 L.O.A.; 21'6" beam; 8'6" app. loaded draft; 2 250-B.H.P. diesel engs.; keel Oct. 18/28; launched Jan. 26/29; deliver April 15/29 est.

Tidewater, hull 1039, oil tanker for Tide Water Oil Co.; 225 L.B.P.; 44 beam; 15'6" loaded draft; 10½ knots speed; 2300 D.W.T.; diesel-electric power; 1000 I.H.P.; keel Jan. 12/29; launch Apr. 15/29 est.; deliver June 1/29 est.

Not named, hull 1040, yacht for Fred J. Fisher, Detroit; 236 L.O.A.; 34 beam; 19 depth; 12'6" draft; 2 1100 H.P. diesel engs.; keel Feb. 12/29.

Not named, hull 1041, yacht for Alfred P. Sloan, Jr., New York; same as above; keel Feb. 12/29.

Not named, hull 1042, yacht for owner not named; same as above; **keel Mar. 12/29.**

Not named, hull 1043, twin screw diesel yacht, ordered by Cox & Stevens, Inc., New York; 168'9" long, 28' beam; two 500-B.H.P. diesel eng.; deliver Dec. /29 est.

THE SPEAR ENGINEERS, INC.,
Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

John M. Dennis, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450-I.H.P. engs.; keel Feb. 18/28; launched Dec. 15/28; deliver May 15/29 est.

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor, keel Aug. 18/28.

Not named, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Ports-

mouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P., keel Feb. 1/29; launch June 1/29 est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Charles E. Evans, hull 264, fire and patrol boat for Commissioners, Washington, D.C.; 55' L.O.A.; 11'9" molded beam; 6'9" molded depth; 5' loaded draft; 31 D.W.T.; 100 H.P. Standard diesel eng.; keel Aug. 25/28; launched Nov. 22/28; deliver Apr. 1/29 est.

Not named, hull 265, steel hull, steam driven, patrol vessel for Supervisors of New York Harbor, 39 Whitehall Street, New York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam; 10'1½" mean draft; T. E. engs.; Babcock & Wilcox W.T. boilers; keel Mar. 20/29 est.

STATEN ISLAND SHIPBUILDING CO.,
Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Dongan Hills, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel July 2/28.

Hull 782, barge for Grasselli Chemical Co.; 150 x 38 x 12'6".

Pittsburg, hull 684, dredge hull for Atlantic. Gulf & Pacific Co.; 162 L.B.P.; 44 beam; 15 loaded draft.

SUN SHIPBUILDING COMPANY,
Chester, Penn.

Purchasing Agent: H. W. Scott.

Not named, hull 116, passenger and freight motorship for American South African Line, Inc., New York; 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs.; **keel Mar. 14/29.**

Blue Sunoco, hull 117, tanker for Sun Oil Co.; 245 L.B.P.; 43 beam; 15'6" loaded draft; 8 knots speed; 2300 Bessemer diesel engs.; keel Jan. 14/29; launch Apr. 6/29 est.

Hull 118, oil tank barge for Sun Oil Co.; 188'6" L.B.P., 31' breadth; 11'6" depth; 6000 bbls. capacity on 9ft. draft; diesel-electric propulsion; 2 Bessemer diesels, Westinghouse motors; **keel Mar. 11/29;** deliver June 30/29 est.

Hull 119, sister to above; **keel Mar. 18/29;** deliver June 30/29 est.

Not named, hull 120, single-screw, diesel tanker for Sun Oil Co., 13,400 D.W.T.; keel May 27/29 est.; deliver Nov. 30/29 est.

TOLEDO SHIPBUILDING CO.,
Toledo, Ohio.

Purchasing Agent. Otto Hall.

Not named, hull 182, fire boat for City of Detroit; 125 L.B.P.; 29 beam; 10 loaded draft; 14 mi. speed; comp. engs.; 950 I.H.P.; 2 B. & W. boilers; deliver Aug./29 est.

TODD DRYDOCK, ENGINEERING & REPAIR CORP.,
Brooklyn, N.Y.

Purchasing Agent. H. J. Shannan.

Yorkville, hull 45, steel double - end ferryboat for City of New York, Dept. of Plant and Structure; 151 L.O.A.; 53 beam over guards; 37'6" molded beam; depth to top of beams 14'3"; draft 8'3"; steam engs.; keel Nov. 1/28; **launched Mar. 28/29.**

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Dwight W. Davis, hull 69, steam propelled towing boat for Inland Waterways Corp., Washington, D.C.; 140x25x9 ft.; 2 500-H.P. Nordberg engs.; equipped to burn powdered coal, keel July 23/28; launched Feb. 9/29; deliver April 20/29 est.

Tom Stallings, 74, Western river type, steam driven 30-ton snag boat for Memphis River and Harbor District, U.S. Army engineers; 127'x30x4'4"; keel Nov. 27/28; launched Feb. 19/29; deliver Apr. 12/29 est.

Hull 77, mooring and fascine barge for U.S. Engineering Office, Memphis; 250 x 26 x 7 ft.; **keel Mar. 14/29.**

Hull 78, same as above; **keel Mar. 20/29.**

Captain George, hull 79, single screw tugboat for U.S. Engineers office, Galveston; 65'6"x17'x7'7½"; 190 B.H.P. Winton diesel eng.; **keel Mar. 29/29.**

Repairs

BETHLEHEM SHIPBUILDING CORP., Ltd.,
Union Plant.

Drydock, paint, misc. repairs: stmrs. Esparta. President Monroe, Lansing, La Perla, Point Arena, U.S.S. Idaho, Betterton, Limon, Capt. A. F. Lucas, Multnomah, San Jose, S. C. T. Dodd, Point Arena, La Marsellaise, U.S.A.T. Kenowis, Martha Beuhner, Chas. Van Damme, m.s. Tosca, Brand. Ethel M. Sterling, Alaska Standard, schr. Necanicum, H. W. Baxter, ferry Peralta, tug Harbor, Shell Barge No. 5, A.T.S. Fe. Barge No. 6, Pacific garbage boat Tahoe. Drydock, misc. repairs: stmr. Svea. Drydock and paint: stmr. Fred Baxter, stmr. Bandon. Propeller repairs: Castletown, President Wilson, m.s. Associates, John C. Kirkpatrick. Drydock, misc. repairs (remove condemned tailshaft from alley and install new shaft): Point Sur. Two cargo winch cylinders, complete: Pacific. Pipe repairs: Athelprince, Strathlorne, Pacific Grove. Misc. repairs: Frank G. Drum, Willpolo, California, McKittrick, Kansan, Suspearco, Point Sur, Makura, Virginia, Pacific, Montezuma, Pat Doheny, Esperanza, Scottsburg, Shabonee, Santa Maria, Tiger, Atlantic Maru, Scottish Strath, Admiral Sebree, Koyo Maru, Lebec, Montebello, Athelprince, Deroche, Bohemian Club, La Brea, Chiapas, Stanley, K. R. Kingsbury, Point Loma, John C. Kirkpatrick, m.s. Silverlarch, Comliebank, Bullaren, Asia, Varanger, Hallanger, U.S.S. Ramapo, Shell Barge No. 4, Harbor No. 1 dump barge, Barge 1927.

CHARLESTON DRYDOCK AND MACHINERY CO.,
Charleston, S.C.

Bottom damage repairs to Norwegian steamer Talabot. Scraping, painting, and minor repairs to Norwegian steamer Annavore.

TODD DRY DOCKS, INC.,
Seattle, Wash.

Grounding damage repairs: Admiral Rodman. Drydock, install new propeller: Admiral Sebree. Drydock, clean, paint: Alameda, Denali, Depere, Derblay, Diamond Cement, Stanley Dollar (also misc. repairs), President Jackson and President Madison (also misc. repairs). Grounding damage repairs: Aleutian. General overhaul: U.S.C.G. cutter Chelan. Drydock, misc. repairs: Olympia, whaler Kodiak. Misc. repairs: Glymont. Electrical repairs: Contra Costa.

PRINCE RUPERT DRYDOCK & SHIPYARD.
Prince Rupert, B. C.

Docked, cleaned, painted, misc. hull and machinery repairs to 7 fishing boats. Docked, cleaned, painted, misc. hull repairs: 3 scows. Misc. hull and engine repairs not requiring docking: 49 fishing boats.

TODD
FUEL OIL
BURNING
SYSTEMS

TODD COAL
PULVERIZER
AND BURNER
INSTALLATIONS

Who did What--and How

The steamer Willbaben [illegible] in port at San Francisco March 7 from the East [illegible]. This vessel, owned by Oregon S.S. Company, is running in joint service with the Williams S.S. Co. The chief engineer, Thompson, put in a [illegible] for Shell marine oils which were pumped into ship's tanks in quick order. This [illegible] not given on the Atlantic [illegible] according to Chief Engineer Thompson. The lubricating [illegible] delivered in tanks or [illegible]. The [illegible] deliveries, however [illegible] engine department a [illegible] trouble. This feature is often talked about among the engineers.

The steamer "Tashmoo" owned by [illegible] Nelson left April 30th for another [illegible] Coast trip. Before she sailed from San Francisco a supply of Shell Oil was taken on. Mr. Thomas, the chief engineer of the Steamer [illegible] Shell Marine Oils leave little to be desired as to the lubricating qualities according to Mr. Thomas.

The Motorship "Hoyanger" of the Westfall Larsen Line in the North America to South America run, arrived at San Francisco March 18th. The chief engineer, Mr. Olson stated that [illegible] had a wonderful trip from South America. The weather was [illegible] and the ocean very smooth, although it was very warm for this time of the year. Shell Lubricating Oil is supplied to this vessel and hundreds of other diesel motorships using Shell Lubricating Oil [illegible] with perfect satisfaction to the engine departments.

The Dollar Liner "President Monroe" arrived into San Francisco March [illegible] with a full list of passengers on another round-the-world voyage. Mr. Pattersen the chief engineer [illegible] that his last voyage around the world was one of the best. The weather was perfect and the Shell Lubricating Oil performed excellent. In fact, the consumption of lubricating oil was cut 25 per cent on this last trip which shows the oilers were very careful not to waste the oil. The high grade of engine oil used can be credited to this low consumption. Shell Oil was pumped into the ship's tanks and the Steamer "President Monroe" was set for another perfect trip.

On April 3rd the Steamer "Malolo" sailed into San Francisco from Honolulu with approximately 450 passengers. The list carried on this voyage of the Steamer "Malolo" is within 5 of the record list of the Steamer. Passenger traffic between the mainland and the islands is heavier this season than ever before, showing the growing popularity of the Steamer "Malolo." A Shell Fuel Oil barge was waiting, ready to go alongside and bunker the popular passenger liner.

Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

Three widely known engineering executives are now engaged in supervising the propulsion and electrical installations on the new giant liner Pennsylvania, third super-express, electrically driven passenger and freight liner for the Panama-Pacific Line.

The Pennsylvania is now fast nearing completion at the Newport News Shipbuilding plant at Newport News, Virginia, and the vessel will come to California on her maiden voyage in November from New York via the Panama Canal. The Pennsylvania, a companion ship to the liners California and Virginia,

Eskil Berg, consulting engineer of the General Electric Company.

will cost approximately $7,500,000.

John Carstairs, senior engineer of the I.M.M., who supervised engine installation on the California and Virginia and made several round voyages on the two liners, is now at Newport News supervising details on the Pennsylvania.

George H. Gaskin, engineering superintendent of the I.M.M., is in complete charge of all the engineering on the Pennsylvania, and will be aboard the liner on her maiden voyage as supervising engineer.

Eskil Berg, consulting engineer for the General Electric Company, and one of the foremost electrical

Announcing

The First Annual

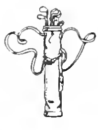
S. S. Golf Tournament

of San Francisco

California Golf Club of S. F., Baden

Thursday, May 9, 1929

Hugh Gallagher, *General Chairman* — Roger D. Latham, *Honorary Chairman*



YOU are requested to inform the Golf Players in your company that they are invited to participate in this first seagoing classic of the links of the San Francisco steamship fraternity. This is the only notification you will receive, as no individual invitations are to be issued

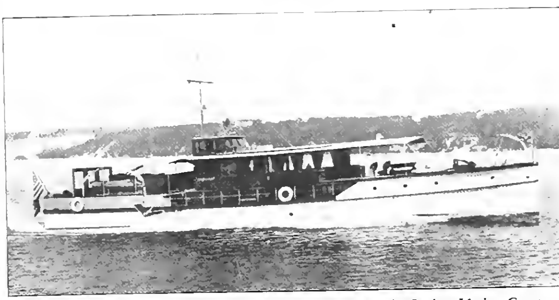
Please have your Golf Players report at once their names, course on which they play, five best scores and club handicap, as well as remit $10, which covers all expenses, including entry and green fees and dinner which will follow the event, at which trophies will be awarded the winners. List closes May 1. Therefore, please ask all those who intend to play to have their names and data entered prior to this date

Address replies and make checks payable to Frank J. O'Connor
Treasurer, S. S. Golf Tournament, c/o Donovan Lumber Company,
260 California Street, San Francisco

Committees arranging for the tournament are

Membership—William C. Empey, *chairman*, Hugh Gallagher, George A. Armes, George D. Zeh. *Course and Entertainment*—Ralph G. Sullivan, *chairman*, A. S. Gunn, Joseph L. King. *Handicap*—L. C. Stewart, *chairman*, Thomas Crowley, Daulton Mann. *Prizes*—Arnold Foster, *chairman*, William J. Edwards, Zac T. George. *Treasurer*, Frank J. O'Connor. *Secretary*, Albert J. Porter

As indicated by the above announcement, the steamship fraternity of San Francisco is intensely interested in the noble pastime of golf. As we go to press we are informed that a large number of notable prizes have been donated for this tournament, and that many steamship executives have made deposits covering their entries and are now busy polishing up their favorite clubs.



75-foot cruiser Radiant, designed by John G. Alden and built by Luders Marine Construction Company for Clifford Hendrix of Larchmont, New York. The Radiant is powered with two Coast Guard model 6-cylinder Sterling engines.

Paul W. Chapman, president, United States Lines, Inc.

engineers in the country, is supervising the installation of electrical propulsion machinery for his company, and will also come to California aboard the Pennsylvania.

William L. Bunker is now actively directing affairs for the United States Lines Inc., as vice-president. Bunker was recently appointed by Paul W. Chapman as one of two vice-presidents to direct important details of the organization, following the purchase by the Chapman interests of the United States Lines and the American Merchant Lines.

Bunker gained his first experience when he started as an apprentice in the old Union Iron Works, San Francisco. He also served as chief engineer with the old Pacific Mail Line, the United States Shipping Board, and the Richfield Oil Company.

Joseph E. Sheedy is functioning as executive officer for the company. **J. Harry Philhin**, well-known on the Pacific Coast, is also a vice-president.

Bunker is in charge of operations and it is said will supervise the building of two new liners of the Leviathan type under the contract with the Shipping Board. Philbin's work covered the taking over of the liners and a general inspection of the ships.

Chapman, Sheedy, and Philbin will make a trip to the Pacific Coast the middle of this month, according to advices from the East.

Eleven new vessels with a total tonnage of 67,900 and costing about $10,780,000 is the ambitious program of the Osaka Shoshen Kaisha, Japanese Line which operates passenger and freight steamers between Puget Sound and the Orient, according to **Mr. Mizutani** of that company who recently arrived at Victoria on his company's liner Arizona Maru.

The **Cunard Line** and **Nippon Yusen Kaisha** have officially announced that an arrangement has been concluded by which each company will act as general agent for the other in Europe, America, and the Orient. This arrangement involves the association of two of the largest steamship companies in the world and makes it possible to offer a complete round the world service under the flags of the two lines.

Seattle shipping circles mourn the death of **Captain R. J. Graham**, 74, picturesque figure of white winged days and former master of the full rigged ship Erskine M. Phelps. Captain Graham died at a hospital in Rochester, Minnesota, on March 20, it was learned in correspondence received in the Northwest recently. Captain Graham was a familiar figure in Pacific shipping circles twenty years ago.

H. F. Alexander, president of the Admiral Line, announces that the coastwise greyhound H. F. Alexander will enter service for the 1929 season on May 9, the liner leaving San Francisco on her first voyage for Los Angeles.

Miss Dorothy Gunn, daughter of A. S. Gunn, manager of the Union Plant, Bethlehem Shipbuilding Corp., Ltd. Miss Gunn sponsored the recently launched tug Eleu.

Joseph E. Sheedy, first vice-president and executive officer, United States Lines, Inc.

The H. F. Alexander has been undergoing complete reconditioning during the winter months at the San Francisco yards of the Bethlehem Shipbuilding Corporation, under the supervision of W. P. Bannister, operating manager.

Captain **Fred Nystrom**, who has been commanding the liner Emma Alexander, will return as master of the H. F. Alexander, and **Captain Fritz Wehde** will be chief officer. Captain Wehde has been skipper of the Admiral Farragut during the lay-up of the H. F. Alexander.

Chief Engineer **James "Jimmy" George**, who has been in active charge of the engine room overhauling of the H. F. Alexander, will be in charge of the propulsion department. **Harry Proctor**, who has been serving as chief steward on the Dorothy Alexander, returns to the H. F. Alexander, and **Bert Gillespie** will be back at his old post as purser. **John Bowles**, assistant purser on the Admiral Benson, will be transferred to the same position on the H. F. Alexander.

European shipyards are going "full blast" constructing new tonnage and European shipping companies are making a survey of Pacific Coast shipping conditions, was the report brought to San Francisco by **W. Leslie Comyn**, head of the steamship firm bearing his name, upon his recent return from abroad, where he made an intensive survey of European maritime conditions.

Comyn stated, that this year will witness the entry of several foreign operated lines into the Euro-

pean-Pacific and Far East trade, and that the vessels of these lines will be the most modern cargo carriers afloat.

One of the projects carried out by **R. C. Thackara,** chairman of the United States Intercoastal Conference, during his visit to the Pacific Coast from his headquarters in New York late last month was the outlining of plans for the institution of a weighing and inspection bureau and a claims department.

The bureau and claims department will be instituted this month at San Francisco, Los Angeles, Portland, and Seattle, and the bureaus will be under the direction of H. M. Runyon, personal representative of Thackara in San Francisco.

Appointment of **T. Kobayashi,** for twenty years with Mitsui & Co. as San Francisco manager, succeeding **M. Tsutsumi,** becomes effective the first of May. Tsutsumi has been transferred to the New York office.

Kobayashi, a college graduate, has worked in various offices of the company in the United States and Japan. He is the youngest manager of the large Japanese steamship Company and is well-known and popular in San Francisco steamship circles.

Promotion of **Captain George H. Zeh** to command the **Lassco** liner City of Honolulu in the Los Angeles-Hawaiian passenger and freight service, was announced by **Ralph J. Chandler,** vice-president and general manager. Captain Zeh succeeded Captain Arthur Self who was recently named a San Francisco Bar Pilot.

Captain Zeh was formerly master of the Harvard. He has been skipper of coastwise passenger liners for more than a quarter of a century.

Command of the Harvard was turned over to **Captain L. B. Hillsinger,** formerly chief officer aboard the liner City of Honolulu.

Captain A. T. Hunter, operating manager for the General Steamship Company, is one of the active sponsors for a California State Training Ship for the training of merchant marine officers.

Captain Hunter stated that a strong effort is being made in the State Legislature to have a bill appropriating funds for a training ship and that there is every indication that the bill will be passed. San Francisco, Los Angeles, San

John S. Willis, assistant general freight agent for the Panama Mail Line.

Diego, Eureka, and Santa Barbara interests are active in furthering the bill, according to Captain Hunter.

Among the well-known steamship men of San Francisco who are active in support of the bill are **Captain Gerrard Tyrrel January** and **Captain Arthur T. Walton,** pilot commissioners; **John C. Rohlfs,** president of the Pacific American Steamship Association; **Captain C. W. Saunders** of the Matson Navigation Co.; **Frank J. O'Connor,** president of the Shipowners Association of the Pacific; **Captain Frank Ainsworth, Captain Walter J. Peterson,** head of the Sea Service Bureau; and **Fred Fenwick** of the Nelson Steamship Company.

Death of **Charles L. Dimon** at the age of 73 years in New York last month removed one of this country's colorful steamship operators. He was head of the Dimon Line, and was well-known in both Atlantic and Pacific maritime affairs. Mr. Dimon resided in Oakland for fifty years. He operated the electrically-driven steamer Cuba for several years in the passenger and freight service between San Francisco and Portland. His son, Grayson Dimon, is president of the Dimon Line.

Miss Bessie Grey, who sponsored the recently launched pineapple barge built at Bethlehem's Union Plant for the Inter-Island Steam Navigation Company.

Fred Johnson is now chief engineer of the Nelson Steamship Company's freighter Castletown. He was formerly first assistant on the Port Angeles.

Andrew F. Mahoney announced that **Eustace C. Hunley** is now head of the engine department of the steam schooner Brookings. He succeeded **James H. Coughlin,** who is remaining shore-side.

Among the changes in the engineering personnel of the McCormick fleet include the transfer of **J. D. Jacobson** from the lumber carrier Celilo to be chief engineer for one voyage on the carrier Munleon. **Dave Graham** on the Munleon was shifted to the West Mahwah as chief engineer and **Harry Barker** went to the Celilo from the West Mahwah as chief engineer. Chief Jacobson was sent to New Orleans to bring out the steamer Hutchinson, recently purchased by the McCormick Steamship Company, and **George H. Clark** of the Wapama was assigned as chief of the Munleon.

Death closed a brilliant career last month with the passing of **John F. Mooney,** vice-president and general manager of the General Engineering and Drydock Company.

Mooney, only forty-three years of age, passed away at his home in Alameda, after a brief illness. News of his death came as a shock to hundreds of friends, as it was believed that he was only slightly ill. He is survived by his father and mother, Mr. and Mrs. James Mooney of Alameda, a widow and four children, three girls and a boy.

James Ambrose has retired after 41 years service as general passenger superintendent of the Cunard Line with headquarters at Liverpool. Ambrose was well known to travelers and shipping men throughout the world. He traveled exten-

sively and has a wide acquaintance on the Pacific Coast.

Glendoyle, a Shipping Board steamer, has been purchased by the **Hammond Lumber Company** and reports state that she will take cargo to Japan, there to be scrapped, as has been the case with several of the vessels this company has purchased of late. The vessel was built at Albina Engine and Machine Works, Portland, Oregon, in 1919.

Page Bros., ship brokers and chartering agents, of San Francisco, Portland, and Seattle, have concluded an arrangement with **J. H. Winchester & Co.**, of New York whereby each firm will represent the other in their respective territories. J. H. Winchester & Co. are large steamship operators on the East coast.

C. Wulffraat, freight department, New York office of the Holland America Line, has been selected to succeed **J. Van Meurs**, in the San Francisco offices of the company, it was announced by E. de Lanoy, Pacific Coast manager for the company. Van Meurs leaves to accept the managership of the Blue Star Line in San Francisco, where headquarters were established on April 1. Wulffraat has been with the Holland America Line for more than twenty years.

Robert G. Kendall is en route to Manila on the President Madison where he will become assistant manager for the States Steamship Company of Portland, Oregon. States Line vessels handle a large volume of cargo from Manila and other Philippine Island ports.

An old-timer in the service of the old Pacific Mail is now employed by the Los Angeles Steamship Company in the person of **C. M. "Jerry" Howard.** Howard was formerly in the claim department of the Pacific Mail Line and when that Line went out of existence he went into the railroad and oil business; but the lure of the waterfront was too strong for "Jerry" and he is now back on the San Francisco docks of the Los Angeles Steamship Company.

Every Friday between the hours of 1:30 and 4:30 p.m., the citizenry of Los Angeles and vicinity will be afforded an opportunity of inspecting the modern liners of the Los

Captain P. T. H. Whitelaw, veteran salvage expert of the Pacific Coast.

Angeles Steamship Company the steamers City of Honolulu and City of Los Angeles. The company in cooperation with the Chamber of Commerce wants the world to know all about the port of Wilmington which is growing by leaps and bounds.

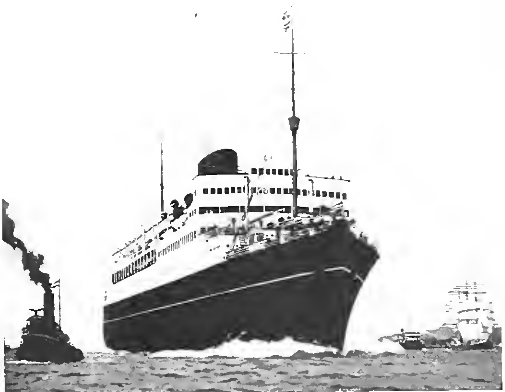
A cable to the San Francisco headquarters of the Flood Line told of the death of **Captain Richard Connell** who fell from the gangplank of his command, the motorship Carriso, when she was tied up at the dock at Samarai, New Guinea. No details were given. Connell was well known on the Pacific Coast and had various commands.

North German Lloyd San Francisco office announces that the damage to the giant liner Europa while considerably less than was at first feared, will prevent the vessel from entering the transatlantic service this year.

The sailings of the sister-ship Bremen will not be altered and her maiden voyage will start on July 16 from the port of the same name. The liner Berlin is to be converted to the cabin class fleet and will be made after her voyage on October 12. The Berlin is now being operated as a first class liner.

Frank Cannon, formerly safety engineer on the Pacific Coast for the Federal Bureau of Mines with headquarters at San Francisco, has taken the post of safety engineer for the Marine Safety Association of the Columbia River with offices at Portland, Oregon.

Captain T. F. McManus is on the bridge of the Matson liner Sonoma vice **Captain W. E. Bell,** who has been transferred as chief officer to the liner Sierra. Captain McManus was transferred from the chief officership of the Sierra in line with the policy of the company to promote those with priority of service.



[From painting by Rodmell Wilkinson.]

An artist's conception of the Chichibu Maru, one of the new passenger liners for the transpacific service of the Nippon Yusen Kaisha. Three of these vessels are now building in Japan, two to be powered with Sulzer 2-cycle diesel engines and the other to have Burmeister & Wain 4-cycle diesels.

Pacific Coast Fresh Fruit Shipping

(Continued from Page 190)

of this tonnage is shipped direct from Pacific Coast ports by water. A considerable portion of it is still sent by rail to Atlantic ports as it was in the days before the Panama Canal. This fact is due to the inertia of established trade movements and to many other complex causes, one of the more important being the lack of any strong export organization among the producers of the distributors of fruit.

Export of Pacific Coast fresh fruits is not new. There are special departments devoted to this trade in some exporting and importing firms on the Pacific Coast. Some New York firms have branch offices in Pacific Coast centers for the buying and shipping of fruit for export. Some of these old factors in the situation have been established in San Francisco for forty years or more. Much of the California fresh fruit is shipped on consignment to New York and for many years has been shipped with the option to the commission house of transshipping to Europe, especially London, if market conditions warrant. Thirty years ago, at a cost of 25 cents extra per 25-pound crate, California silver prunes could be strapped for export, labeled "Coes Golden Drop," transported to London, and would often bring 50 cents to one dollar more than the price obtainable at New York. What the cost of this would be today the writer is not prepared to say; but undoubtedly much scattered business of this kind helps to make up the 4500 tons of other fresh fruits listed for 1928.

Conclusions

From this sketchy survey two conclusions are evident.

First, the steamship lines are ready to adequately service present needs and to take care of considerable expansion in this refrigerative service.

Second, it is up to the producers to develop foreign markets for the export of these products and to put this business on a more permanent basis.

The total present tonnage of exports of fresh fruits (including Canada) is less than one per cent of the total production tonnage. There is ample supply for large expansion of export in Pacific Coast fresh fruits, and much opportunity apparent in the growing markets of the Orient and Latin America.

Ship J. B. Brown

(Continued from Page 182)

A few days later I was given a chance to work my way to San Francisco, signing on the Pacific Mail steamer San Juan at twenty-five cents per month. Chief officer McKinnon, later Captain McKinnon, was my good friend in this connection. The San Juan called at practically all the ports between Panama and the Golden Gate and was 21 days on the run.

After consulting an attorney at San Francisco, I swore to a truthful statement of the Callao affair which was telegraphed to Secretary of State James G. Blaine at Washington. When I had last been at Callao I had learned that my two shipmates Paddy and Charley were still in jail. This fact was included in my affidavit and in less than 48 hours we had word from Washington that the United States Minister at Lima had ordered the release of the two men and while I was still at San Francisco three months later they showed up there. They had had no hearing nor trial of any kind and, but for the news of their predicament reaching Washington, would probably have remained prisoners for years. So far as I personally was concerned, there was nothing to fear so long as I kept away from Peru.

A few months later the J. B. Brown arrived at San Francisco and I was soon on board to thank Captain Cameron in person for his many acts of kindness. I rejoined the ship in the capacity of second mate.

Captain Cameron "crossed the bar" at Sailors Snug Harbor several years ago. An excellent navigator and in every way a first-class seaman, he was also a very kindly gentleman. Mrs. Cameron, always highly esteemed for her many fine qualities, had passed into the great hereafter a few years before the captain. Their little boy, who was wont to walk the poop and imitate his father in giving orders on the old J. B. Brown, is now himself a captain and stands at the head of his profession.

Electric Drive Economies

(Continued from Page 186)

A concrete example will show the method of calculation. On Table No. I, Layout No. 1, it will be noted that the water rate at the propeller shaft is given at 9.05 pounds per propeller shaft horsepower hour; on Table No. II it will be noted that the power for excitation and motor ventilation amounts to 185 kilowatts and that the water rate of the auxiliary generator is 17.2 pounds. The pounds of steam required for excitation and motor ventilation therefore equal 185 x 17.2, or 3182 pounds, which, divided by 17,000 shaft horsepower, gives a value of 0.187 pound per shaft horsepower hour. The water rate in this particular instance, including the motor, generator, excitation, and motor ventilation losses, therefore equals 9.05 plus 0.187 or 9.237 pounds per hour. Referring to Chart No. 1 we find the theoretical water rate for the given steam conditions to be 6.625 pounds. The overall efficiency on the Rankine cycle is therefore 6.625 divided by 9.237, or 71.7 per cent. Calculating by the same method, the over-all efficiencies for Layout Nos. 2, 3, and 4 are 72.5, 73, and 72.2 per cent, respectively.

The transmission efficiency, which is of little comparative significance in an economic sense, is given herewith to settle the long drawn out arguments concerning it. It represents the losses between turbine output and propeller shaft output. The combined motor and generator efficiency in Layouts Nos. 1, 2, 3, and 4 is 95.7 per cent; the water rate at the turbine shaft is therefore 9.05 x 0.957, or 8.65 pounds per horsepower hour. The water rate at the propeller shaft, including excitation and motor ventilation, is 9.237 pounds as before. The transmission efficiency, which equals $\frac{\text{B.H.P.}}{\text{S.H.P.}}$ therefore equals 8.65 divided by 9.237, or 93.7 per cent.

Likewise if we want to know the turbine efficiency on the Rankine cycle efficiency we can divide 6.625 by 8.65, which gives 76.5 per cent.

(To be Continued)

Port Construction Notes

Oakland, California. Work of building Warehouse B at the new Fourteenth Street Terminal is progressing, and contract for driving warehouse foundation piles was let recently to M. B. McGowan at the rate of $5.14 a pile. Pacific Coast Engineering Company of Oakland was low bidder for supplying 444 tons of structural steel at $84.40 per ton for the warehouse. Bids will be called shortly for furnishing 54 steel rolling doors.

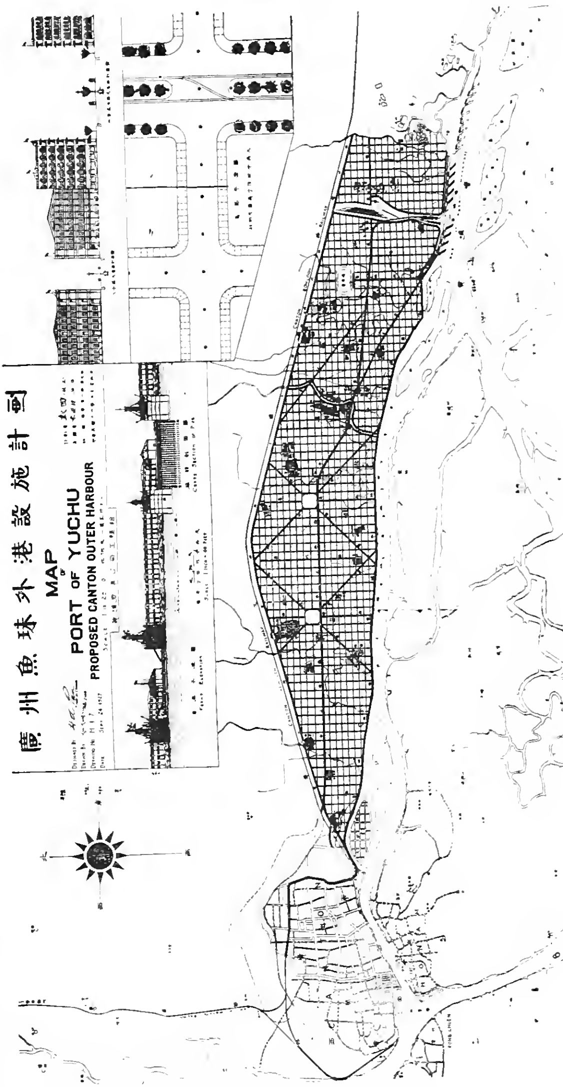
Warehouse B will be completed by the fall of this year and has been leased to Libby, McNeill & Libby, said to be the world's largest shippers of canned food products. The contract calls for an annual rental of $34,656.80 and a guaranteed minimum tonnage of 50,000. Libby, McNeill & Libby guarantee to employ this terminal as their principal shipping point for all San Francisco Bay exports, and it anticipated that the annual tonnage passing through the warehouse will be nearly 150,000.

Warehouse A has already been rented to Rosenberg Brothers of San Francisco, California's largest shippers of dried fruits.

Several shipping lines have already applied for space at the new dock, including W. R. Grace & Co., Holland-American Line, North German Lloyd, Hamburg-American Line, and Furness Line.

Richmond. The Harbor Board is having plans prepared for the future development of Richmond harbor and waterfront which call for dredging operations and filling of shoal waters to form 1600 acres of new industrial sites. The project would require 16 to 20 years to complete.

San Francisco. Governor C. C. Young and Major Chas. L. Tilden, president of the Board of State Harbor Commissioners, have approved a proposal for the Harbor Board to build a gigantic cold storage terminal on Mission Rock, off the southern part of the San Francisco waterfront, this terminal to be joined to the mainland by an extension of Pier 50. It is proposed that the terminal include docks, trackage, sheds, warehouse, and a shipside refrigerator plant to handle fruits, vegetables, canned and



One of the very interesting schemes now being pushed forward in connection with port improvements in China. This plan will provide a modern outer-harbor for the city of Canton.

dried fruits and vegetables, and other California products, and depot facilities for the commissary department of the U. S. Navy. Mission Rock is approximately 800 feet square.

The Industrial Land Developing Company has purchased from the South San Francisco Dock Company 200 acres of uplands and tidelands of Hunter's Point, including all of that section south of the portion owned by the Bethlehem Shipbuilding Corporation. A seawall 1400 feet long will be constructed and the tidelands filled to develop industrial sites having deep water frontage for ocean-going ships. This section will be provided with rail facilities by the proposed Western Pacific Railroad line into San Francisco.

Stockton. Major General Edgar Jadwin, chief of Army Engineers, Washington, D.C., has given his approval to plans for the Stockton deep water project turning basin, which will be located west of Mormon Channel. The basin, when completed, will be 1900 feet long and 850 feet wide. The dredging will be done by the federal government when all channel rights of way are clear. The city will construct wharves and sheds.

Portland, Oregon. The Standard Oil Co. has let a contract to the Jacobsen Construction Co. for a 650-foot wharf to be built in the joint oil basin in the Bridgeport district. The Shell Company and the Union Oil Company are said to be planning docks at the same terminal. The Western Oil & Refining Company of Los Angeles is reported to have decided to build a terminal on the Portland waterfront and enter the Oregon field. Richard Florian is president.

Six concrete grain bins of 200,000 bushels capacity are being added to the grain terminal operated by Kerr, Gifford & Co., giving a total grain storage space of 1,200,000 bushels. They will be completed in November. Kerr, Gifford & Co. will spend about $25,000 in new equipment.

Anacortes. Favorable action of the Supreme Court of the State of Washington in declaring a $300,000 port bond election legal has opened the way for the improvement and extension of docking and shipping facilities at this point. Plans for the project were drawn up by H. W. Davies, secretary of the Seattle Port Commission, acting as consulting engineer. The Anacortes Harbor Board consists of W. F. McCracken, Howard J. Sackett, and Walter Keyes.

The Greatest Port in the World

THE Port of New York is the largest single factor in handling United States water-borne traffic and may very justly claim the largest volume of cargo movement among the world's ports. We quote the following significant figures from a recent statement issued by the Merchant Fleet Corporation:

"A ship enters or leaves the Port of New York every 10 minutes of daylight hours. In foreign and coastwise traffic, 70,000,000 tons of cargo move in and out of the port annually.

Owing to the great amount of local manufacturing and the vast local merchandising, estimates are that more than 50 per cent of the total foreign commerce originates in or is destined to the New York region.

The area of the port district as defined by law is almost 1500 square miles and the population is about 9,000,000. The district is located in portions of two states and embraces nearly 200 municipalities.

The port has a waterfront 483 miles in length, of which New York has 270 miles and New Jersey 206 miles. Measured around piers, the sides only, the total length is 633 miles. The value of the water-borne commerce of this district in 1925 was more than $8,177,190,342.

In the last 30 years, more than $600,000,000 have been spent in providing new tunnels and bridges for vehicles, passengers, and freight, in order to tie the port together and to facilitate movement between all sections. The Port of New York Authority, which was organized a few years ago to improve terminal and transportation facilities in the district, is now building what will be the world's longest suspension bridge and also an arch bridge that will eclipse all others.

Assertions heard from time to time that the Port of New York is congested are indignantly denied by port spokesmen. In this connection, the Port Authority states: 'There has been no congestion in the handling of import and export freight through the Port of New York in the last five years, or since extraordinary conditions brought about by the World War spent themselves. Facilities are adequate to take care of a 50 per cent increase.'"

Work Boat Notes

(Continued from Page 199)

coasts. She is said to have cost about $85,000.

This shipyard completed last month the power cruiser Acushla Machree for J. H. Logel of Santa Monica. The cruiser is 83 feet long, powered with two 90-horsepower **Union** diesel engines, and has a cruising radius of 6000 miles. The cost was about $80,000.

San Pedro Boat Building Co., San Pedro, California, has just received an order for a 100-foot bait boat for Y. Nakasuji, fishing for the California Packing Corporation. The boat will have a raised deck and carry a crew of 10. Her propulsion power will be supplied by a 350-horsepower **Western-Enterprise** diesel engine and she will have a cruising radius of 6000 miles and speed of 12 knots. The boat was designed by A. D. Lee, marine superintendent of the California Packing Corporation at San Pedro and will cost about $70,000.

Otto Poulson of Los Angeles, owner of the fishing boat Glenn Mayne, a 142-foot vessel, is having the vessel converted to a tuna fishing boat and will have two **Atlas-Imperial** diesel engines of 350-horsepower installed. The boat will have a cruising radius of 12,000 miles. She is the largest tuna fishing boat operating out of Southern California harbors. She will fish for the California Packing Corporation.

Lake Washington Shipyard, Houghton, Washington, recently launched the cannery tender David B. for Libby, McNeill & Libby, for use in Alaska waters. She is 65 feet long, 16 feet 6 inches beam, and 7 feet depth. Her power plant consists of a 100-horsepower **Washington-Estep** diesel engine. The boat has accommodations for six persons. Auxiliary machinery is supplied by Allan Cunningham of Seattle.

Freights, Charters, Sales

April 18, 1929.

THE following steamers have been reported fixed with grain to U.K./Continent: British str. King Robert, Vancouver to two ports British Channel, 29/-, Apr. May, L. Dreyfuss & Co.; British str. Rio Diamante, Columbia River to U.K./Continent 30/-, option British Columbia loading 29/-, April May, Strauss & Co.; British str. Rio Dorado, Columbia River to U.K./Continent, 30/- May, Kerr, Gifford & Co.; British str. Dalblair, Columbia River to U.K./Continent, 30/-, option British Columbia loading 28/-, May, Kerr, Gifford & Co.

The following lumber fixtures from the North Pacific to Australia have been reported: American str. Ethel M. Sterling, Grays Harbor to Newcastle, N.S.W., Mar.; Danish str. Parana, San Francisco and Columbia River to Sydney, Merchandise and Lumber, J. J. Moore and Co.

The following lumber fixtures from the North Pacific to the Orient have been reported: Norwegian str. Kalfarli, Coos Bay and Columbia River to Shanghai, May, Dant & Russell; a steamer, one port North Pacific to two ports Japan, $8.75, May/June, Canadian Transport Co.

The following lumber fixtures from the North Pacific to West Coast have been reported: Japanese str. Iwatesan Maru, Columbia River to Talara and Callao, $12.50, May; American str. Missoula, Columbia River and Eureka to Guatemala, Salvador, Porto Rico, and Bermuda, April, Hammond Lumber Co.

The following lumber fixtures from the North Pacific to Atlantic have been reported; Norwegian str. Erviken, British Columbia to North of Hatteras, Mar., Seaboard Lumber Sales Co.; British str. Ashby, British Columbia to two ports St. Lawrence River, Apr., Canadian Transport Co.; Japanese str. Kakutatsu Maru, British Columbia to New York, April, H. R. MacMillan Co.; British str. Warlaby, British Columbia to North of Hatteras, Apr./May, Seaboard Lumber Sales Co. Ltd.

The British str. Norwich City has been fixed with lumber from Columbia River to U.K./Continent, May/June, by Balfour, Guthrie and Co.

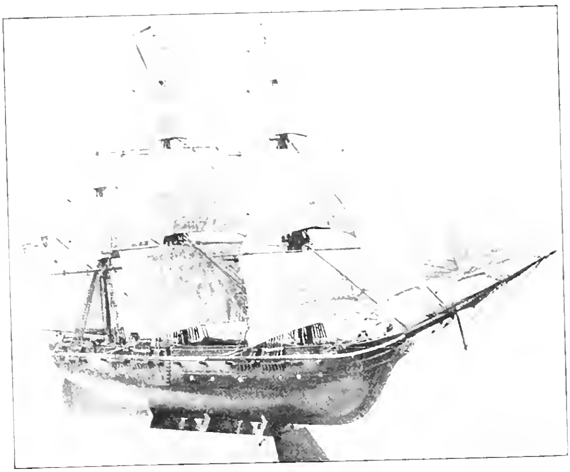
The following time charters are reported: British str. Woodfield, four months, delivery Cuba, redelivery North of Hatteras via North Pacific, $1.10, Apr., Canadian Transport Co.; British m.s. Titanian, Pacific Trade, delivery Taku Bar, redelivery China, Japan, or Australia, $1.35, Apr./May, J. J. Moore & Co.; British str. Errington Court, delivery Honolulu, redelivery South Africa via North Pacific, 5/3, Mar. Apr., J. J. Moore & Co.; British str. Benmohr, delivery British Columbia, redelivery U.K. Continent, $1.60, Apr./May, Canadian Transport Co.; Norwegian str. Trevanion, Pacific Trade, four to six months, $1.10, May, Canadian Transport Co.; British str. Golden Sea, delivery China, redelivery North of Hatteras, via North Pacific, lumber, $1.15, Apr./May; British str. Hartside, delivery and redelivery North of Hatteras, via North Pacific, lumber, $1.25, Apr.; British str. Bencleuch, delivery British Columbia, redelivery, U.K./Continent, $1.50, May/June, Canadian American Shipping Co.

The following sales are reported: British m.s. Quadra $1625, to be scrapped, U. S. Marshall to American Iron & Metal Works of Oakland; American str. Neponset, $120,000, U. S. Shipping Board to Luckenbach Lines; American str. Glendoyle, Atlantic Fruit Co. to Hammond Lumber Co.; American str. Wisconsin Bridge, U. S. Shipping Board to Nelson S. S. Co.; American str. Democracy, $79,000, U. S. Shipping Board to Nelson S.S. Co.; American strs. West Bridge, $57,000, and West Wauneke, $73,000, U. S. Shipping Board to Sudden & Christenson; American str. George E. Weed, $20,000, U. S. Shipping Board to Flood Bros.; American str. Pasadena, Albion Lumber Co., to Haviside Co.; American str. West Hosokie, $82,000, U. S. Shipping Board to Los Angeles S.S. Co.; American strs. Willkeno, Willboro, Willpolo, Willsolo, Willfaro, Willzipo, m.s. Willmoto, Williams Steamship Company to American Hawaiian S. S. Co.; British str. E. D. Kingsley, Kingsley Navigation Co. to F. Waterhouse & Co.; American str. Frank D. Stout, A. F. Mahoney to Redwood Line; American str. Georgian, American Hawaiian S. S. Co. to Kenneth D. Dawson, Portland.

PAGE BROTHERS, Brokers.

PACKING MERGER

The formation of one of the largest salmon packing organizations in the Northwest was completed last month, when the Alaska Pacific Salmon Corporation, of Ketchikan, Alaska, took over the canneries and floating equipment of six merging concerns. The deal includes 17 salmon plants and 244 vessels ranging from small fishing craft to large cannery tenders.



CLEANER FUEL FOR BETTER OPERATION

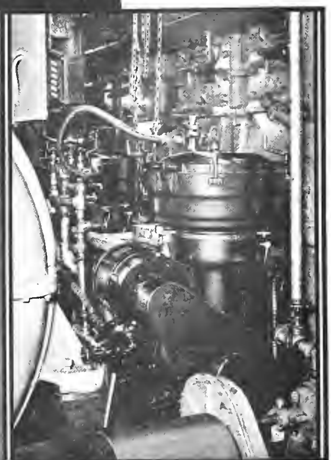
IT IS FAR more economical to remove dirt from the bowl of a **De Laval Fuel Oil Purifier** than to remove from the combustion chambers of an engine accumulations resulting largely from the use of dirty fuel.

—But that is only part of the story. Removal of dirt and water from fuel oil protects the valves . . . helps maintain compression, which means increasing the power output . . . eliminates frequent regrinding. It protects rings and cylinder liners, lessening the danger of scoring.

—And then clean, dry oil is obviously better fuel . . . capable of producing more power and promoting regular firing.

De Laval centrifugal purification has proved itself the better way of cleaning lubricating oil on the vast majority of the world's modern turbine- or Diesel-driven ocean-going tonnage. There is no reason why you should be satisfied with lower efficiency in fuel oil purification.

Write today for Bulletin 106-Y

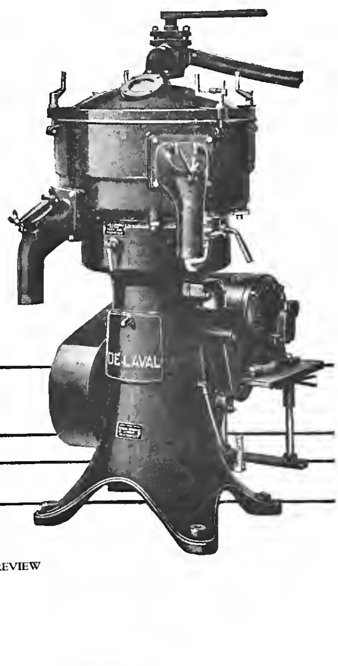


This illustration shows a typical installation of two De Laval Fuel Oil Purifiers on a modern Diesel-driven vessel. The Purifiers operate on a closed system to prevent the escape of gases while running oil at high temperature. Sight glasses and inspection doors enable the operator to tell at a glance all he needs to know about the operation of the machines.

Flexible hose connections are quickly broken when the Purifiers need to be cleaned of sediment, and within 10 to 15 minutes they can be put in service again.

THE DE LAVAL SEPARATOR CO.
New York Chicago

DE LAVAL PACIFIC COMPANY, San Francisco
THE DE LAVAL COMPANY, Ltd., Canada
ALFA-LAVAL CO., Ltd., London, S. W. 1.



DE LAVAL OIL PURIFIER

Pacific Marine Review

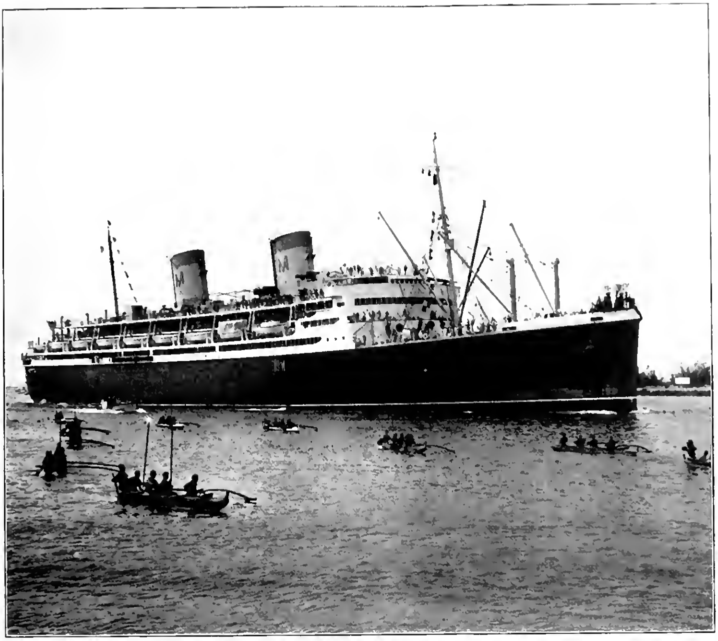
The National Magazine of Shipping

JUNE, 1929

Official Organ PACIFIC AMERICAN

Official Organ SHIPOWNERS' ASSOCIATION

Pacific Marine Review, Vol. 26, No. 6, Published Monthly at 576 Sacramento Street, in San Francisco, Entered as second class matter at the post office at San Francisco under the act of March 3, 1879.



Malolo entering Honolulu Harbor

AMERICA'S speed queen of the Pacific is now on her Forty-First round voyage between San Francisco and Honolulu, and is giving better satisfaction to her passengers with every trip.

On September 21 she leaves San Francisco on a Round-the-Pacific Cruise, including the ports of Yokohama, Kobe, Peking, Shanghai, Hongkong, Manila, Saigon, Bangkok, Singapore, Batavia, Soeraboya, Sydney, Melbourne, Auckland, Suva, Pago-Pago, Hilo, Honolulu, and Home.

Pacific Marine Review

The National Magazine of Shipping

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

Entered as second class matter June 20, 1913, at the post-office, San Francisco, under the Act of March 3, 1879. Entire contents copyright, 1928, by J. S. Hines. Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 15th. Subscription price, a year; domestic, \$2; foreign, \$3; single copies, 25c.

Official Organ
Pacific American Steamship Association

James S. Hines,
President and Publisher.

Bernard N. De Rochie,
Vice-Pres. and Manager.

Official Organ
Shipowners' Association of the Pacific

Alexander J. Dickie,
Editor

Paul Faulkner,
Advertising Manager.

Some Resolutions Affecting Directly or Indirectly America's Marine Policy

AT the recent annual meeting of the Chamber of Commerce of the United States, that body adopted a number of very common-sense, business-like resolutions covering recommended policies for the national government along certain departments of its activity. Among these resolutions there were a number covering the American merchant marine and subjects directly and indirectly affecting foreign trade and shipping. The wording of these resolutions and their subject matter presents an ideal set of editorials for an American shipping magazine in the month of June, 1929. We therefore, without further apology, reproduce them herewith as editorials for Pacific Marine Review with full credit to the Chamber of Commerce of the United States.

Merchant Marine

THE annual meeting has had before it a report on "Handicaps to American Shipping." For the reasons appearing in this report we believe there are steps which should now be taken to complete the removal of the menace of government competition and which would materially assist the private American merchant marine. Except as to a few ships considered as reserves, the vessels of the government laid-up fleet should be scrapped or sold for scrapping. The contract principle should be applied to assist in completing the disposal of the Shipping Board lines and at the same time providing for further needed development of our overseas shipping services, including the movement of seasonal peak traffic; and when such disposal of lines has been accomplished a reduced Shipping Board should be given the status of an agency to carry on the regulation of the relation of merchant shipping to the public. As further measures to eliminate government competition with private enterprise, steps should be taken to remove the Panama Railroad Steamship Company from the shipping business; the shipping requirements of the Panama Canal should be secured from private shipping companies.

The revision of the navigation laws now in progress should be actively prosecuted to completion, and the changes affecting the Steamboat Inspection Service recommended in 1916 by the Chamber's Committee on the Department of Commerce are recommended for consideration. The duties of the Treasury Department affecting vessel measurement should be transferred to the Department of Commerce, and there should be national and international standardization of the admeasurement rules. Changes proposed by the report in the Seamen's Act, none of which would adversely affect seamen, should be made. Service records of seamen should be maintained through continuous discharge books. There should be legislation providing for adoption of the Hague Rules in form suitable to American conditions.

Restrictions on the disposal of ships abroad should apply only to those in which the government has an interest or to which it has given aid. Congress should take the necessary steps to cause the Shipping Board to withdraw from the business of marine underwriting. The provisions of the Model Marine Insurance Law now in force in the District of Columbia and several states should be adopted in all states. Congress should be asked to make the necessary appropriations to give the Merchant Marine Naval Reserve proper financial support, and to provide and maintain proper quarantine facilities.

Tariff Commission

THIS Chamber has by early referendum approved the principle of maintenance and encouragement of our export trade in tariff legislation so far as consistent with reasonable protection for American industry. In recent years there has developed a great appreciation of the necessity for maintaining fair and just protection for America's higher wage scales and living standards yet coupled with an appreciation that international trade under proper conditions benefits America as well as other countries and that there should be no unnecessary trade barriers. In the determination of a fair and just protective tariff schedule accurately reflecting these considerations and flexible enough to meet changing economic conditions, adminis-

trative authority is required to act promptly after investigation and within legislative limits. This Chamber has consistently supported, from an early date, the legislative permission for adjustment of tariff rates by administrative authority within the limits prescribed by Congress. While the Chamber does not now specifically recall its earlier recommendation for both a fact-finding Tariff Commission and a separate Tariff Adjustment Board, this Chamber expresses a desire that the established Tariff Commission should be strengthened by the necessary authority for expeditious determination of these questions with full responsibility under the President of the United States.

Import and Export Prohibitions

DURING 1928 the United States, with 27 other nations, signed the International Convention for the Abolition of Import and Export Prohibitions and Restrictions and a supplementary agreement to the convention, designed to remove barriers to foreign commerce which have carried over from the years of the World War or have appeared during the post-war adjustment. It does not affect the tariff systems or the treaty-making methods of the participating countries. In the United States such restrictions have been removed, but in many important foreign markets, particularly of Europe, certain restrictions still apply. American exporters have found their activities substantially affected by the obstacles which the convention aims to remove. Ratification of the convention by the Senate of the United States is urged, therefore, in further support for our foreign trade.

Immigration

THE provisions of the Immigration Law of 1924 which apply the quota limit system to the countries of Europe, Asia, Africa and Australasia, on the 1890 census basis of foreign born, have been in operation now for nearly five years. These provisions have become an accepted part of our national policy. Our industrial and sociological life, our citizens, and our foreign-born residents, as well as foreigners abroad who are contemplating coming to this country for permanent residence, have largely adjusted themselves to this policy.

During this period the so-called national origins provision of the 1924 Immigration Law, which originally was intended to replace on July 1, 1927, the quota limit system based on the 1890 census, referred to above, has not been in operation. This provision purposes to limit immigration from old world countries to about 150,000, as compared with the 164,667 at present admissible, and to allow an annual quota to any nationality equal to a number which bears the same ratio to 150,000 as the number of people living here in 1920 having that nationality bears to the total number of our inhabitants. This provision has been twice postponed by Congress in the face of problems, as yet unsolved, connected with the development of a satisfactory plan for the accurate determination of the racial content of the country.

It would be a mistake, in our opinion, to disrupt the adjustments which have been made under the actual operation of the law to date, and by changing the basis of present quotas unnecessarily to stir up racial antagonisms. We, therefore, recommend the repeal of the national origins provision of the Immigration Law of 1924, and urge the continuance of the quota limit system now in operation based upon 2 per cent of foreign born living here in 1890.

Passports

HIGH fees charged by our government to its citizens for the passports they require are a burden upon international travel necessary to commerce. Whatever the conditions which led to the present fees, those conditions would seem to have passed. We believe the time has come when our government should reduce its fees for passports to a reasonable charge for the service which is performed. This recommendation is made with recognition of the progress which has been made by our government in making reciprocal arrangements with other countries with respect to passports and visas.

Transpacific Press Messages

THERE is need of improvement in transpacific facilities to permit more complete press messages upon important subjects. That there may be improvement in such facilities, we request the government of the United States to make representations to the Chinese government for the purpose of obtaining from the Chinese government equality of American companies with the companies of other countries in rights heretofore granted by China relating to press messages, which rights expire in 1930.

Commercial Aeronautics

AIR transportation is essentially national in scope. State legislatures are urged to have interstate rather than merely intrastate service in mind for their citizens when drafting aeronautical legislation and member organizations are urged to support this principle.

Uniformity of aeronautical legislation is necessary and it is important that in enacting such legislation the states should conform their laws and regulations to those of the federal government.

The establishment of airports is essential to the proper expansion of air transportation. Appropriate legislation should be enacted to enable the states, municipalities and counties to appropriate funds and acquire lands for the practical development of aeronautics through the establishment of airports and the encouragement of the use of aircraft.

Some Good Advice for Manufacturers

IN a paper read before the Sixteenth National Foreign Trade Convention, April 17 at Baltimore, David Leslie Brown (author of Export Advertising, and former manager of the Advertising, Sales, and European departments for Goodyear) gave some excellent advice to manufacturers in regard to assisting their distributors abroad by proper advertising. This advice is equally pertinent for the success of domestic distribution. We cull the following flashes:

Advertising is the fuel, the gasoline of business. And the newspapers and magazines are the spark-plugs.

Aid your distributor, because by doing so you are aiding your own business. Get it out of your head that by supplying him with samples, direct matter, signs, and so forth, or sticking his name on a piece of newspaper copy you are doing him a favor. You're not—you're doing yourself one. Give the distributors this help whole-heartedly, not grudgingly.

Give your foreign distributors the best you have, the newest material. Give them something special when they ask for it, if your appropriation permits and your advertising department, agency, or export department approves it. Give them the most you can afford, not the least.

Another Story of the Great Atlantic Storm

THE America rescued the crew of the Florida; the America's crew became heroes. What happened to the tanker Dannedaike is another story.

The Dannedaike was the first ship to answer the S.O.S. of the Florida, and set out immediately to the rescue. The storm was terrific and the waves were tumbling skyscrapers. They fell upon the Dannedaike and buried her decks. The Dannedaike had no direction finder and was forced to circle in her search for the Florida. As she nosed around, the seas got her. Sparks send out word that they were proceeding with great effort. But actually she was held at a standstill by the onslaught of great seas.

In a moment when she was hove to. a particularly large sea rose up and broke down thundering on her foredeck. A hatch cover was ripped away, and number one hold filled with water. The same wave crushed the pumphouse as though steel were cardboard. Steam lines were torn loose; ventilators were erased from the deck; plates were battered in; and the steering gear was stripped. The telegraph line was torn apart, and the dial in the engine room registered on "Stop Engine." Chief Engineer H. J. Malarky made a guess. The indicator said stop; and his hunch told him that was not an order but an accident. He kept the engine full ahead.

Captain Mathaisen, Third Mate Johnson, and Quartermaster Haggerty were on the bridge. They felt the Dannedaike shudder under their feet. then rise up gallantly from under the deluge. And they saw an even larger wave climb up before their eyes. The flying bridge and pilot house took the blow. The bridge was torn adrift and the pilot house demolished. The steering wheel, wrenched from Haggerty's hands, was flung over the Captain's head; two spokes were broken, and it hung on his neck like a millstone. He lay unconscious with a severe scalp wound. Haggerty and Johnson were stunned. Sailors fought into the wreckage and dragged the trio out of the tangle before it went overboard. Johnson had both legs broken and three ribs smashed. Every port had given way under that blow, and even the crow's nest was battered and the foremast had been twisted three points. A collie pup, sitting in the wreckage, was barely saved from being washed away. The Second Mate snatched him back just in time.

Now the Dannedaike sent word that she had to abandon hope of reaching the Florida. The Chief and his men, despite the pounding seas, rigged a jury rudder. The Chief and Pumps, waiting for a chance, rushed forward between waves to open a valve and jettison cargo. A course was shaped and the Master, recovered from his injuries enough to carry on the fight, wirelessed his owners:

"Now limping toward Bermuda. Score pretty near tied with Old Dave that time. Regards to all."

Much buffeted, the Dannedaike at last made port.

[Bulletin Standard Shipping Co.]

"We Told You So"

IN view of the much quoted recent speech of Lord Kylsant in connection with the power plant of the new "super-leviathan" for the White Star Line, Pacific Marine Review may be forgiven for doing a little boasting. Lord Kylsant has declared that the new ships will be electrically driven and that preliminary investigation figures indicate diesel-electric drive as the most economic plant for the ship.

In October 1917, Pacific Marine Review published an article prepared jointly by the late Milton L. Towne, chief engineer of the Oceanic Steamship Company's liner Sonoma, and R. Z. Dickie, consulting naval architect and marine engineer of San Francisco. This article advanced the theoretical argument for the economies to be obtained by operating a coastwise vessel under the diesel-electric system as compared with the then in vogue Scotch boiler reciprocating engine system.

We are not claiming that this was the first suggestion for the application of electric transmission gearing between a diesel and the propeller. We are fully aware that very early in diesel development, even as far back as the closing days of the last century, electric transmission was used before diesel engine designers had learned much about the reversing of that prime mover; but we think it is worthwhile to record here how the prediction of our old friend. Milton Towne, is being worked out in practice.

Twenty-Five Years Ago

Pacific Marine Review (then published in Seattle) for June 1904 carried the following interesting items:

A (then) new application of wireless and sound signals for getting from shore stations approximate bearings so as to establish an approximate fix in heavy fogs was tried out with good success on the steamer Plymouth coming into Narragansett Bay on the way from New York to Boston.

Foreign carrying trade of the United States for 1903 was reported to be divided between American and foreign vessels by value as follows:

Foreign vessels	$2,026,102,388
American vessels	214,695,032
Percentage for American vessels	9.0

To every good citizen of the United States we say, "My son, forsake not the mainstay of thy country. Bind these figures upon thy forehead! Tie them about thy neck! When thou goest to the polls let them lead thee; when thou sleepest may they disturb thy dreams; and when thou wakest may they still talk to thee."

A rather interesting and instructive paper on the subject of Antifouling Compositions was recently read by Mr. A. C. Holzapfel before the German Institute of Naval Architects.

(Editor's Note. Mr. Holzapfel is still annually producing interesting papers on this and allied subjects before the world's great technical societies.)

The cable ship Burnside loaded 800 miles of submarine cable preparatory to completing the Seattle-Sitka connection. She performed part of the work on this line last summer, but worked in the Philippines during the winter season.

The Belle of Oregon

A Short History of Besse's Famous Bark

By F. C. Matthews

ON July 7, 1875, the bark William H. Besse, owned and commanded by Captain William H. Besse of New Bedford, entered the port of San Francisco after a very fast run from Hong Kong with general cargo and 435 Chinese passengers, or "coolies." Shortly after arrival Captain Besse turned command of the vessel over to Captain Frost and went East to arrange for the construction of two larger barks for account of himself and some friends in Portland, Oregon. These vessels were built by Goss & Sawyer at Bath, Maine. The first to be completed was launched in April, 1876, and named Western Belle. Two months later the second left the ways under the name Belle of Oregon.

The figurehead of the Belle of Oregon, as preserved on the Weld estate, Boston.

Captain Besse had for some years owned and personally commanded vessels engaged in the trade in the North Pacific Ocean, largely that of carrying passengers and cargo between the Columbia River and China. In 1868 he had bought from the United States Government the wooden screw steamer Genesee and converted her into a sailing vessel of 666 tons register which was renamed Hattie C. Besse. The Genesee had been built in the Charlestown Navy Yard in 1863 as a gunboat and was then attached to the West Gulf Blockading Squadron as a third rater, mounting 8 guns and carrying a crew of 113 men. She was considered a fine vessel and the fastest of her class in the service. She had but a single deck with only 12 feet depth of hold, against a length of 207 feet and a beam of 35 feet. On account of her model, Captain Besse had her rigged as a four-masted bark and on her arrival at Portland, Oregon, from New York in 1869 she was credited with being the first four-masted vessel to enter the Columbia River. From Portland she crossed to China and returned with some 400 coolies, being the fourth vessel so engaged since inauguration of the traffic two years previously.

Captain Besse soon left the Hattie C. Besse to build the bark Alden Besse in which he continued until 1873 when the William H. Besse was built. The important portion of this transpacific trade was the importing of coolies for railroad and other labor. The traffic was highly remunerative to carriers and on relinquishing command of the William H. Besse in 1875, Captain Besse retired from sea life to devote his entire time to the management of his increasing shipping interests. Success continued to crown his efforts and ten years later he was listed as owning a controlling interest in a fleet of fine ships and barks aggregating over 15,000 tons.

The bark Belle of Oregon was of about 1100 tons register, net, and originally hailed from Portland, Oregon. Her handsome figure-head was symbolical of the trade in which it was thought she would be employed to a considerable extent, the transport of grain to Europe. This image was so valued that the outstretched arm with hand grasping a sheaf of wheat was detached while the vessel was at sea lest it be broken off in heavy weather. In case the Belle of Oregon should be operated in transpacific trade, she was equipped with large housing accommodations on deck. However, her operations in the coolie carrying business were limited to two runs from Hong Kong to Portland and a single run to San Francisco, she having come on the scene only a short time prior to the inauguration of strong agitation to prevent further Chinese immigration.

During an active career of about twenty years the Belle of Oregon was operated on various trade routes but mainly those to the Far East and her sailing record was consistently good. In 1882 she went from Astoria to Queenstown in 97 days and, after crossing to Boston, made the run thence to Melbourne in 87 days. In 1877 she was 42 days from Hong Kong to San Francisco and only 155 days thence to Queenstown, this figure including time spent at Baker's Island loading a guano cargo. In 1887 she passed Java Head in the very fast time of 18 days from Manila, and her whole run of 102 days from the Philippine port to New York was the best passage that season.

Incidents occurring during a passage of the Belle of Oregon from New York to Saigon with case oil in 1886 are thus described by a member of the crew: "When we sighted Table Mountain, Cape of Good Hope, the 'table cloth' was well spread indicating an approaching blow. Next day the weather suddenly became thick and stormy and we were shortened down to lower topgallants, with decks filled with water. The watch was stationed on top of the after house by the mizzenmast and two men were at the wheel. It was about four bells in the middle watch and the water was filled with a phosphoric glow so that it looked like a sea full of lights. The mate had gone below for a moment and the old sailor who had the weather wheel began to let the ship go off. The mate rushed up the companion way just in time to see us passing a large full rigged ship shortened down to lower topsails on our port side. We were close enough so that I could have tossed a biscuit on her deck. The

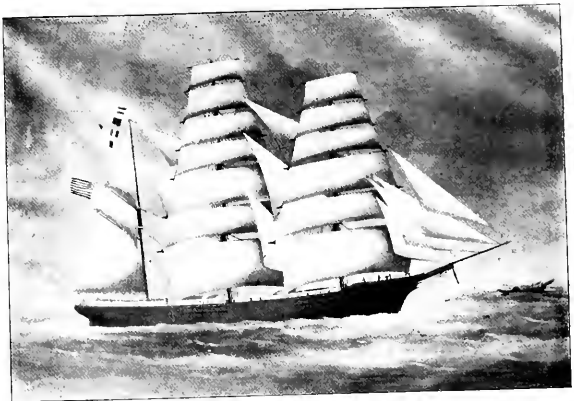
water being filled with so much glow, the question has always been, 'what did the man at the wheel see that caused him to take matters into his own hands?' He told us he saw a glimmer of light that he thought had come from the binnacle of a ship ahead, but this, of course, would only show as the ship would rise on a wave, under certain conditions and probably at long intervals. This old sailor had been in the navy during the Civil War and claimed that once before he had had a similar experience. However, be that as it may, had it not been for his intuition, or whatever it may be called, we would have struck the other ship squarely in the stern and not a soul would have been left on either vessel to tell the tale.

"In the Indian Ocean we sailed for days through fields of floating pumice, patches of blue water being caught sight of only here and there. We had the usual troubles so far as rows on board are concerned and as the food was quite poor, a delegation was sent aft to complain. The result was that we were put on our whack, or government allowance, all articles being either weighed or measured out each morning before a member of the watch. Later on, when nearing China, there was nearly a refusal to do duty and all hands were called to the mainmast where the mate with his note book made entries of the confab and the boy members of the crew were put to work shining up the handcuffs."

In 1892 the Belle of Oregon loaded general cargo at Portland for New York and all went well until she got down to latitude 14 north, when a hurricane lasting 22 hours was encountered. The fore and mizzen topmasts and main topgallantmast were carried away; foremast sprung; bulwarks and chain plates lost; galley gutted, etc. The cargo shifted and 7 feet of water got into the hold. Three of the crew were washed overboard but were washed back on board by the returning swell. When the storm blew out, a course was steered for San Francisco where necessary repairs kept the vessel in port some siz weeks.

The first master of the Belle of Oregon was Captain Jacob Merriman who continued in command until taking the new ship Henry Failing in 1882. In 1878 the captain narrowly escaped death by falling into the vessel's hold while in port at Astoria. He was very seriously injured but pluck and a strong constitution pulled him through. His successor in the Belle of Oregon was Captain Edwin Matthews who had bought into the ship and who later appeared as managing owner as well as master. Captain Matthews was very proud of his vessel, keeping her up in good condition, and she made a fine appearance with her hull painted a sort of bronze green, the captain's favorite color.

The Belle of Oregon was converted into a coal barge in the late '90's and operated along the Atlantic Coast for several years. She met her end in a gale, going down with her master Captain William C. Harding and his crew of three men.



The American bark Belle of Oregon under full sail.

American-Hawaiian Oriental Service

THE South China steamers of the Oceanic & Oriental Navigation Company are now making Haiphong and Bangkok regular ports of call.

Every other steamer calls at Haiphong, and alternate ships stop at Bangkok, giving these two ports a regular forty-two day service. In addition, every other South China steamer makes Hongkong first port of call thus inaugurating the first direct service from San Francisco. Alternate vessels stop at Shanghai as first port of call, giving both Hongkong and Shanghai direct services from as well as to San Francisco without intermediate calls.

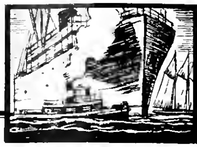
The decision to make Haiphong a regular port of call will be of material aid to shippers, because cargo consigned to Haiphong but transshipped at Hongkong is subject to a heavy duty by French Indo-China. This new service will make transshipping at Hongkong unnecessary and thus save this duty to shippers and place Haiphong in the same category as Saigon.

Under the new schedule North China steamers serve Japanese ports and sail direct from Shanghai, giving that port two outward sailings a month.

This new arrangement will permit of still greater stabilization of the schedule, since ports heretofore designated as outports but having heavy cargo consignments will now be regular ports of call and can be included on the steamers' itineraries.

The Oceanic & Oriental Navigation Company has recently rounded out its first full year in the Oriental service under American-Hawaiian management and has made satisfactory progress in producing new business and rendering efficient service to Pacific Coast and Oriental ports.

There is now a sailing from San Francisco every 25 days in the North China service, and every 21 days in the South China service, giving direct connection to 21 ports in China, Japan, French Indo-China, Siam and the Philippines.



Trade, Traffic, and Shipping

The Business of the Sea

By James A. Farrell,
Chairman, National Foreign Trade Council

JAMES A. Farrell, president of the United States Steel Corporation, and chairman of the National Foreign Trade Council, speaking on the subject of "The Business of the Sea" delivered a very thoughtful address at the Sixteenth National Foreign Trade Convention at Baltimore, April 19. With clear, convincing logic, President Farrell seeks to dispel some of the errors that are so prevalent in the propaganda of those nationals who are loudly claiming exclusive privileges in the matter of ocean transport of freights of national origin. Here follow excerpts from this masterly address:

It is a noteworthy fact that the five or six industrial nations that are our keenest competitors are also the heaviest purchasers of our products, manufactured as well as crude.

Our country is far from being self-sufficient and its internal prosperity is largely influenced by the material progress of other lands and by the good will of their nationals. Perhaps nowhere has this phase of the fundamental conditions of international exchange been more noticeable than in the field of oversea transportation.

Ownership of goods in transoceanic transit cannot be claimed exclusively either by the buyer or the seller. Nor can it be said that the exporter is more the absolute owner of the goods which he ships than the importer is of the wares or commodities which he purchases.

The claim to exclusive privileges in the transport of goods by sea has been described as leading logically to the transfer of cargoes from ship to ship in midocean, since there would be nothing for the outward bound ship to carry homeward, all nations reserving to themselves the transport of their own export commerce.

We must recognize the fact that ships, like foreign goods, are a part of the business of the sea.

Nothing can more effectively sow the seeds of pernicious doctrines leading infallibly to economic measures that gnaw at the vitals of sound foreign trade, than the fashion of regarding commercial advance in a given field as a form of "penetration." Particularly deplorable is the recent habit of speaking of "commercial conquests" when referring to advances in foreign trade.

Government In Shipping

Shipping was the last of our national industries to be demobilized after the war, and to a great extent demobilization of shipping has not yet been accomplished. The very presence of the instrumentality of government in the shipping industry has had a strong occult influence upon the destinies of American shipping.

The prejudice aroused has reacted more or less upon all American shipping, and it may be pertinent to ask whether the time has not come to warn against boasting of the peaceful activities of our ships, on their uneventful journeys to the markets overseas, as a manifestation of collective mass action, since any vessel, whatever may be her flag, must give impartial service both to the countrymen of her owners and to the citizens of other nations who ship goods on her. Regardless of the private opinions of some ship owners, the laws compel them to render equal service to all of their clients; and it cannot truly be said that American ships are serving American trade more when they leave an American port with cargo than when they sail from a foreign port with cargo of foreign origin for an American destination.

Taking ocean borne trade alone, exclusive of the Great Lakes, total imports by American vessels in 1928 were 46 per cent of the whole, of which government vessels had 6 per cent and privately owned American vessels 40 per cent. In exports of the same class, American vessels had 22 per cent of the total, of which the government vessels had 12 per cent and privately owned vessels 10 per cent. It may be asked whether the smaller percentage of imports than of exports carried by government vessels was caused by a deliberate avoidance of such tonnage by foreign shippers.

Perseverance of Shipowners

These figures show the extent to which the ocean borne trade of this country is still under government control, although the percentages have been somewhat reduced as against the government portion by the recent activity of the Shipping Board in disposing of several governmental services to private owners together with the fleets used on those routes. That such material results were obtained by privately owned American ships under the conditions which have confronted their owners in recent years is the best answer that can be given to any question that may arise as to the permanency of the services built up by private American enterprise under the most adverse circumstances. No other American industry ever faced such a situation. The fact that 1,500,000 tons of privately owned shipping engaged in foreign trade, built largely before the war at prices ranging from $80 to $120 per deadweight ton, has survived and is still operating in competition with the fleets of the world speaks well for the perseverance of private management. Only the unbounded faith of private American shipowners in the soundness of their position, through the experience of years and the efficiency of the men and material employed by them, has enabled them to survive artificial handicaps far greater than the economic burdens upon the operation of the ships themselves.

Various measures have been put into force of late to assist the continuity of the services sold by the government to private owners. Many privately owned ships

and lines continue to be operated without assistance from the government. These lines, representing as they do a sound growth in the face of world competition and having persisted despite many discouraging conditions, are deserving of every encouragement and most certainly under no circumstances should they be handicapped by the fostering of competing cargo lines. It would be a poor foundation on which to build if American cargo lines that have maintained themselves without assistance should be in any way handicapped by the creation of new assisted services in the same trade routes. While the policy of mail subventions and fleet renewals by means of government loans to purchasers of Shipping Board tonnage is still in the preliminary stage, the problem of promoting the growth of what may be termed "free shipping"—that is to say, free of government connections—may require attention in the future.

Much of the efficiency attained by American owners of free tonnage through the adverse period of the past few years has been due to the application in the shipping industry of methods the worth of which had been demonstrated on land. To improvement in operation, however, there should logically follow a like progress in material, and in this respect there lies ahead a most important problem.

Shipbuilders Need Help

The economic conditions which gave a distinctively American character to the management and manning of American ships should also be given consideration in the evolution of the ships themselves. The process concerns primarily the shipbuilding industry, which will be called upon to provide American shipowners with the types of ships best suited to their needs. Back of the ships there must be building yards capable of turning out replacements and meeting new needs. While the problem of traffic, manning, and operating may be regarded as practically solved, the differential in the cost of tonnage built in this country under present conditions cannot possibly be overlooked.

The maritime nations of the world have built some 1550 ocean going vessels in eight years, aggregating 9,800,000 gross tons. At the same time about 40 vessels, aggregating 400,000 tons, have been built in American yards in that period. The average age of the American cargo ships now operating is in excess of ten years. In another ten years at the present rate of building, considering that the useful life of a ship is twenty years, some Macauley will be predicting that an American will be standing on the bridge of a lonesome ship, scanning the horizon in vain for a craft bearing the flag of his country. Cargo ships at the parity of foreign costs mean assistance to the shipbuilder. There are many private ship owners of cargo vessels in overseas trade who have not felt the pecuniary stimulus of $6 to $30 per deadweight ton for ships plus mail pay but who feel that at equal costs they can compete with the privately owned cargo ships of other countries.

While the Jones-White Act was progressive and helpful, it must be recognized that it does not extend the same help to strictly cargo vessels, which really make up the bulk of the American tonnage and in which the greatest interest lies in so far as the shipping public is concerned, as it does to vessels carrying passengers and mails. Such additional help would permit the shipbuilding industry to proceed with the design and construction of new modern tonnage in advance of the needs of American shipowners on various trade routes and this work could be carried on in such a way as to effect economics in the cost of building ships in this country.

The present law enables shipowners to obtain loans for the acquisition of new ships, but it does nothing to encourage the shipbuilder to go ahead of the demand and use his own resources to bring into being types of ships best adapted to the needs of American shipowners on the various trade routes.

In spite of occasional statements to the contrary, American foreign trade has proved an economic benefit to all those who have been concerned in it, alike to producers, dealers, carriers, or consumers, and every step in its progress of recent years clearly shows that the future development of American shipping and shipbuilding is not predicated upon a decrease in the material well being of other shipowners or shipbuilders. On the contrary, it cannot fail to augment the present volume of international commerce and extend the sphere of seaborne transportation with resulting benefits to all.

Prospects of United States Foreign Trade

By Robert P. Lamont, Secretary of Commerce*

THE past history of our trade and that of the trade of the world as a whole holds out high promise for the future. Now that we have become the world's greatest manufacturing country and that manufactured products are the greatest class in our exports, we have every reason to anticipate steady expansion in our foreign trade, perhaps even more rapid than that of most other countries. The truth is that the normal thing in international trade is growth, growth not only faster than that of world population, but faster than that of world production. As I have said the exports of all countries during the twelve or fifteen years preceding the war increased at the rate of about 5 per cent annually, as against a growth of probably less than one per cent a year in the total number of inhabitants. Productive capacity in every country was rising and trade growing still more. The same factors for progress are at work now. Science, invention, and discovery are constantly opening new resources and cutting down costs of production. Education is making the masses of the people better workers. The rapid building up of capital is strengthening further the arm of man.

Although standards of efficiency are much lower in most countries than in America, the same upward push which we see so conspicuously here is manifest the world over. In many foreign lands it is being helped along by the participation of American capital, American management, and American engineering and research.

It is natural too that commerce between nations should grow faster even than industry. Notwithstanding the aim of each country to build up and diversify its home industries and make its economic life self-sufficient, the ties among nations multiply. As peoples become richer they demand more comforts and luxuries,

*Extract from an address before the Sixteenth National Foreign Trade Convention, Baltimore, April 17, 1929.

more variety. To meet these desires they reach out beyond their borders for more and more commodities which their own country, by the nature of things, cannot produce, or which at the given stage of development it is not yet ripe to produce. Improvements in transportation and communication cheapen the cost of international business. The people of each country grow more familiar with the products of other countries; the printed page, the film, and the radio spread the knowledge and awaken the desire. The vigorous efforts of exporters, aided by governments, constantly widen markets. All that is necessary to assure steady and large growth of foreign trade throughout the world, and of our own trade in particular, is peace.

Our own country has been in the past, and may be in the future, an exception to the rule that trade grows faster than production. The explanation lies in the fact that our production has expanded more than that of most other countries, and that their buying power for our products has risen less rapidly than our own buying power for them. The war, of course, contributed to this result. We export now, the experts tell me, about the same proportion of our total product, and even of the output of our factories, as thirty years ago.

Careful study of the statistics that have been furnished me confirms the belief, which I have always held, that there is a mutual interest among nations in economic development. We in America have come to feel strongly, especially during recent years, that sense of mutuality as regards our own internal economic life. We believe that every industry and every class profits by the prosperity of every other. The same holds true of the world as a whole.

The one thing most essential to the progress of our export trade is increase in buying power all over the world. We cannot build it up by merely becoming more efficient nor by driving competitors out of foreign markets. When the war closed we heard some pessimists declare that with Europe's recovery we should lose much of the trade we had gained during the time when she was unable to supply her customary markets. Quite the contrary has happened. The restored ability of Europe to produce and export has been a major factor in building up our exports both to Europe itself and to other parts of the world, which in turn have found their buying power increased by the ability to sell more foodstuffs and raw materials to European countries. It is to our interest that Europe should expand still further in its export of manufactured goods. The prosperity of our farmers is much affected by the prosperity of European factories. Europe itself takes more of our manufactured goods than any other continent. The increase in our sales of factory products to Europe since 1922 has been more than 60 per cent, a rate higher than appears in our trade with the world as a whole.

The bogy is sometimes set up that the development of factories in new or backward countries, now chiefly dependent on imports for manufactured goods, will tend to cut down our trade. Quite the contrary has happened in the past and will almost certainly happen in the future. When a country builds up its own factories it normally buys also more factory-made goods from abroad. The great manufacturing nations are all big customers of one another. Whatever interests one interests the others.

Picture for yourselves what would happen in our export trade if China, with its 450,000,000 people, or India with its 250,000,000, could build up its productive capacity till it equalled our own per man. Remarkably self-sufficing as is the United States, its imports per capita are some twenty times those of China and fifteen times those of India. Suppose those densely populated countries were rich enough to afford automobiles in the measure that we do, one for every five inhabitants! That would mean something like 140,000,000 motor cars. Suppose we should continue to be the world's chief purveyor of motor vehicles! How many of Detroit's motor plants would it take to supply such a demand?

I am perfectly aware that this picture is a bit fantastic, but it suggests a valid principle. China and India and other so-called backward countries, and all countries the world over, have been making steady progress so long as peace ruled. They have taken more and more commodities from us and from one another. They can and they should go forward ever faster, since the factors at work here and elsewhere to build up productive capacity are of a cumulative character, each step making the next step easier.

While we should and do wish to see other nations make progress in their exports, this attitude should by no means lead us to relax our own efforts to build up trade. If the producers and traders of every country work hard to expand their sales abroad every country will profit. Competition is the life of international trade as of domestic. This great organization of yours is rendering a highly important service. So too the Department of Commerce, with its thorough organization at home and its scouts all over the world, is contributing in a very real measure to the well-being of our country.

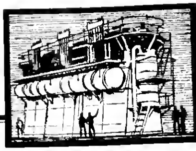
In this connection it is a source of great satisfaction that more and more of the smaller manufacturing firms are getting over their inferiority complex and contributing in large measure to our export business. It has been said that in former years 75 per cent of our export trade was supplied by 15 large companies. Certainly this is not true at present. Small firms all over the country are selling goods to the far corners of the world.

It must be realized that 85 to 90 per cent of our manufacturing concerns employ less than 100 wage earners and that these small firms make up a considerable proportion of our total production.

There are over 23,000 firms on the mailing lists of the Department of Commerce to receive foreign trade information.

Each day the Department handles 13,000 inquiries on export subjects, and most of these are from small companies which cannot afford export departments and must depend upon official channels of information.

The United States may well be proud of the magnitude and the growth of its export trade. We must export always more and more if we are to bring in the materials and exotic foodstuffs which will help raise still more our standard of living. Exportation, moreover, is a highly useful "fly-wheel" of industry. Foreign markets often take up much of the slack resulting from temporary depressions or shift a demand at home. It is not to our interest to become more dependent on foreign countries for what we consume or for outlets for our products. But neither is it to our interest to lose anything of our standing in world trade. As our domestic production and trade grow the foreign trade must move along with it.



In the Engine Room

Operating Economies of the All-Electric Ship

By Frank V. Smith,
Federal and Marine Dept., General Electric Company.

PART II.

THE relative overall efficiencies obtainable through auxiliary electrification versus steam auxiliaries is subject to correct evaluation only by means of a thorough thermodynamic analysis of specific layouts and not by generalization. The efficiency of the steam auxiliaries used, the percentage of total steam used by them, and the uses that may be found for the disposal of the exhaust all have a direct bearing on the subject. As a general rule, if all of the auxiliaries on a ship are driven by steam and are non-condensing, there exists a large excess of auxiliary exhaust steam above that which can be utilized in the feed water heaters.

If this excess were by-passed to the main condensers it would start a series of pyramidal losses that would be quite disastrous to the economies. In the first place it would do one of two things—either reduce the vacuum and lower the power output of the main power plant, or cause an increased duty to be placed on the circulating pump. In the latter case the auxiliary steam consumption is again increased, and this in turn requires a slight speeding up of the feed pumps, the forced draft blowers, the condensate pump, and the fuel oil pumps.

On the other hand, if the excess auxiliary exhaust steam were by-passed to the main turbines, it would perform work and relieve slightly the amount of steam required at the main turbine throttle. Theoretically at least the latter method has a good deal in its favor; practically it may not work out so well. Long auxiliary exhaust lines accumulate condensate, the auxiliaries may carry oil over into the condensers, and, at reduced powers of the main turbines, the vacuum may extend pretty well up into the turbine. The results are blade errosion, poor heat transfer in the condenser because of fouled tubes, and the realization of but a small amount of power because of the large pressure drop between the auxiliary exhaust line and the stage of the turbine at which steam is admitted. The use of a mixed pressure type of turbine also increases the amount of steam entering the condensers.

Now in steam vessels in which steam auxiliaries are used we find all degrees of economies from good to bad. The only method of determining relative efficiencies is to determine first the true operating characteristics of the steam plants we wish to compare and then to perform that difficult task of computing complete heat balances in each case.

Auxiliary electrification is one of the finest methods of improving the economy of operation of a ship. The gains however are never 100 per cent of the differences shown by the relative auxiliary steam consumption of the two methods. If all of the auxiliaries are electrified the heating of the feed water must be accomplished by other methods than the use of auxiliary exhaust. When steam is extracted from the main turbines for feed water heating, the steam so extracted—not having had an opportunity to complete its cycle—represents a

FEED WATER HEATING SYSTEM AND GENERAL OPERATING INFORMATION

LAYOUT	#1	#2	#3	#4
FEED WATER HEATING SYSTEM:				
Extract from Main Turbines for Low Pressure Feed W. Heater Lb.-Hr.	18000	15500	13500	11500
Admit at Main Turbine Throttle in Lieu of Extracted Steam	7800	6500	5350	4075
Steam Auxiliary Exhaust Available at 10# G. for H.P.-Feed W. Heater Exclusive of Air Ejectors	5950	5400	5450	7250
Calculated Temperatures:				
Feed Tank (Allowing 5°F. for Radiation)	109.5	109.5	109.	110.
Temp. Rise L.P. Feed W. Heater	89.5	89.0	86.5	72.5
Temp. Rise H.P. Feed W. Heater	31.0	31.5	34.5	47.5
Final Temp. Feed Water	230°F.	230°F.	230°F.	230°F.
MAIN CONDENSERS:				
Pounds Steam per Hour to 2 Main Condensers	143 650	129 380	119 010	114 125
B.H.P. of Main Circulating Pumps Based on Pumping 80# of Water per Pound of Steam Condensed, against a 26 ft. Head; Pump Efficiency Assumed 80%	188.0	170.0	156.0	150
K.W. with 91% Efficient Motor	154.0	139.0	128.0	124.0
EVAPORATION PER LB. FUEL OIL:				
Total Heat of 1# of Steam at Boilers B.T.U.	1267	1325	1364	1367
Heat in Feed Water (230-32)	198	198	198	198
Heat to be Supplied by Fuel	1069	1127	1166	1169
Heat Value of Fuel Assumed	18500	18500	18500	18500
Average Operating Boiler Efficiency - Assumed	.82	.82	.82	.82
Actual Evaporation per Lb. Fuel Oil	14.18	13.46	13.02	12.98

Table III.

ECONOMIC DIFFERENCES

TURBINE DRIVEN AUXILIARY GENERATORS

GENERATOR SETS

Electric Auxiliary Power Load (See Table II) - K-w.	719	702.5	690.7	686
Less Aux. Condenser Auxiliaries	25	25.0	25.0	25
New Auxiliary d-c. load	694	677.5	665.7	661
W/R at Main Unit for M-G. Set	14.1	12.7	11.65	11.1
Steam Consumption, Lb. Hr.	9800	8600	7750	7350
Previous Steam Consumption	12370	11050	10100	9550
Saving, Lb.-Hr.	2570	2450	2350	2200
Air ejector for aux. cond's.	600	555	515	485
Total Saving - Lb. Steam Hr.	3170	3005	2865	2685
Total Steam Consumption basic layout (See Table I) Lb.-Hr.	183 600	164 780	151 350	145 590
Saving through use of M-G Set	3 170	3 005	2 865	2 685
New Steam Consumption	180 430	161 775	148 485	142 905
Lb. Fuel Hr. New	12 750	12 000	11 400	11 000
Lb. Fuel S.H.P. - Hr.	.75	.705	.67	.647
Tons of Fuel Day	136.5	128.5	122	117.8
Saving in Tons per Day	2.5	2.5	2.5	2.2
Percent Saving	1.8	1.9	2.0	1.8

Table IV.

New Diesel-Electric Coastwise Tanker

De La Vergne-General Electric Equipped, Clean Oil Tanker for the Tide Water Oil Company Building by Pusey & Jones

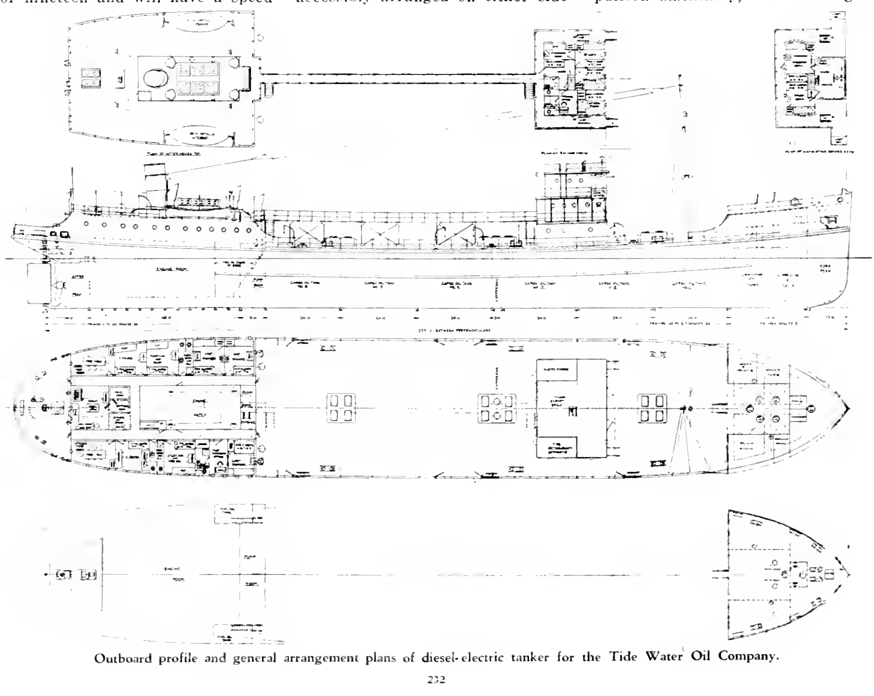
THERE was launched April 23 at the yard of The Pusey & Jones Corporation, Wilmington, Delaware, a very interesting clean oil tanker for Atlantic Coast service of the Tide Water Oil Company. A short description of this vessel appeared in a former issue of Pacific Marine Review. Her principal characteristics are:

Length between perpendiculars	225′0″
Beam	44′0″
Draft	15′6″
Deadweight capacity, tons	2,400
Capacity, clean oil, barrels (approx.)	20,000
Capacity, lubricating oil, gallons	55,000

The clean oil is carried in six main cargo tanks, and the lubricating oil in four tanks built into the fore hold and one tank in the fore peak. The vessel will carry a crew of nineteen and will have a speed of 10½ knots. She is built on the Isherwood System and will be propelled by a diesel-electric power plant furnished by the General Electric Company and I. P. Norris-De La Vergne, Inc.

The main power plant consists of two 6-cylinder, 4 cycle, trunk piston De La Vergne engines of 17-inch bore and 24-inch stroke, developing 625 horsepower at 225 revolutions a minute. Structural steel subbases bolted to the flat bottom of the bed plates of these engines extend under the flywheel and generators to the base of the outboard bearing pedestal; so that the diesel engine generating set is tied together as a single unit insofar as its connection to the hull of the ship is concerned. In these engines the cylinders are cast individually and are equipped with removable cylinder liners. The injection system consists of two spray nozzles accessibly arranged on either side of the cylinder head and injecting fuel in a horizontal direction into the combustion chamber shaft in the lower part of the cylinder head. The cylinder heads are entirely water-cooled. This design eliminates the necessity of cooling the pistons even in sizes up to 22 inches bore. The engines are equipped with the standard De La Vergne governor which controls the point of cut off of the fuel injection and maintains a close speed regulation guaranteed to be 4 per cent or less. These engines are strictly cold starting. All bearings are pressure lubricated and the storage tank on this particular job is so arranged that should there be a failure of the lubricating oil circulating pump the storage tank would still supply all bearings by gravity with sufficient pressure to assure proper operation.

In designing the hull and propulsion machinery, a thorough



Outboard profile and general arrangement plans of diesel-electric tanker for the Tide Water Oil Company.

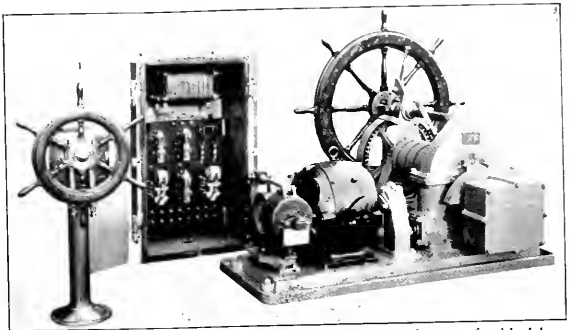
check was made of torsional vibration and it was determined that the operating range of speeds of all moving parts was well beneath the critical vibration period.

Each of the six cylinder engines is directly connected to a General-Electric 410-kilowatt, 240-volt generator and a 45-kilowatt exciter. These generators furnish power to a General-Electric double armature one thousand shaft horsepower, 130 revolutions a minute, motor, directly connected to the ship's propeller.

For lighting and auxiliary power purposes, there is a 45-kilowatt General-Electric generator operated by a Winton 4-cycle, solid injection diesel capable of generating 100 horsepower at 300 revolutions a minute. Control of the propulsion machinery is on the Ward-Leonard system with control stands in the engine room and also in the pilot house; so that full control of the ship can be had directly from the pilot house at all times.

The cargo pumps on this job are supplied by the Northern Pump Co. and are all motor driven, motors being supplied by the Electro-Dynamic Co.

The regular run of this tanker will be between Portland, Maine, and Hampton Roads and particular attention has been paid by the designers to the comfort of the crew. The galley is equipped with an Edison electric range and food is kept in fresh condition by the installation of a ¾-ton motor driven Brunswick-Kroeschell ammonia compression, direct expansion refrigerating plant.

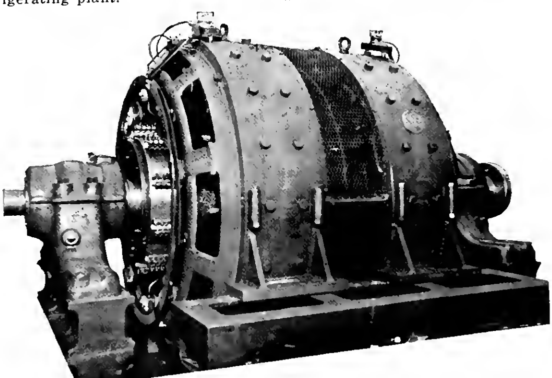


Steering column, control panel, and electrically operated steering gear furnished by Allan Cunningham, Seattle, for the Tide Water Oil tanker.

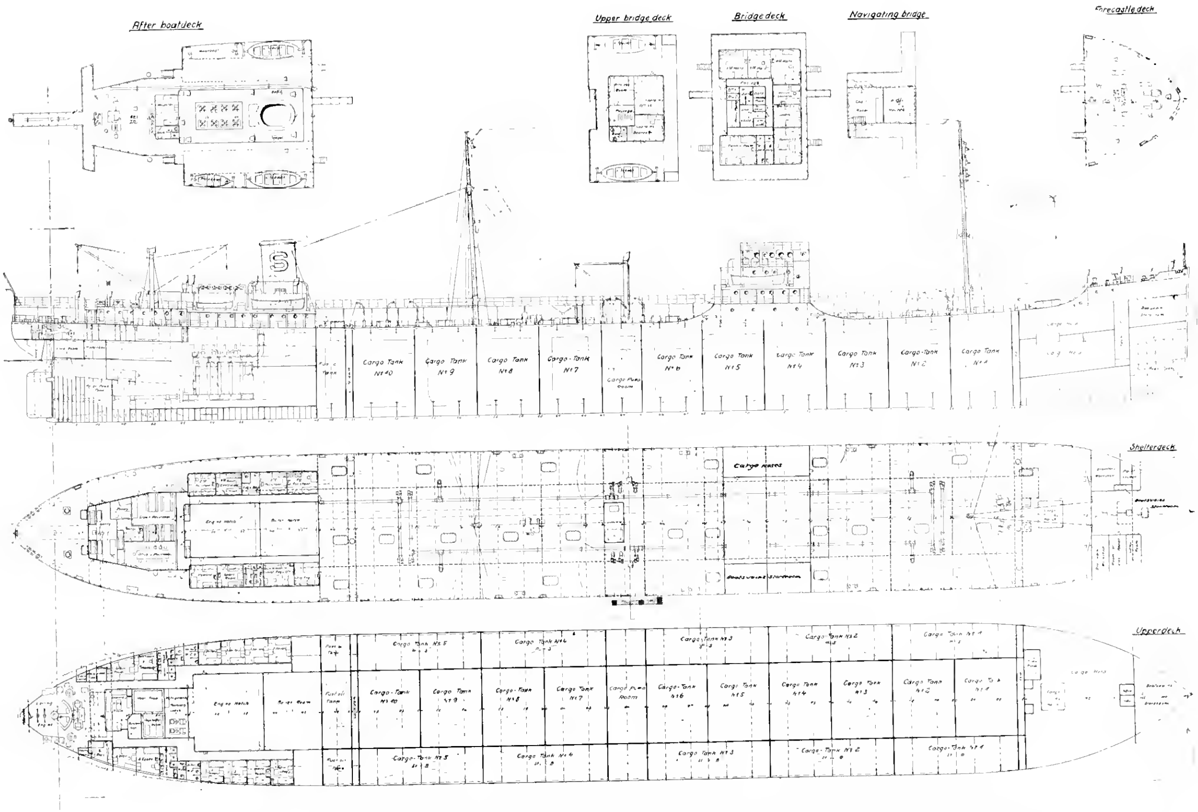
Special navigation equipment consists of a Sperry searchlight, Cory rudder indicator, and Allan Cunningham steering gear. Complete wireless outfit was supplied by the Radio Corporation of America.

Clean lubricating oil is assured by the installation of a Sharples supercentrifuge, and safety from fire through a complete equipment of carbon dioxide fire extinguishing apparatus.

One point of interest to Pacific Coast readers in connection with this new Atlantic Coast tanker is the fact that her deck machinery and steering gear were built in Seattle by Allan Cunningham and shipped to The Pusey & Jones Corporation in Wilmington, Delaware, for installation. This machinery includes the anchor windlass, the capstan, and the steering gear. The windlass is of the self-contained, triple spur geared, electric drive type, all bearings being fitted with bronze bearing shells, all gears and wildcats of cast steel. The shifting screws, brake screws, and all parts which might cause trouble by rusting or corrosion are made of stainless steel or bronze. The windlass is fitted with a spring loaded safety clutch which acts as a mechanical protection to the windlass and to the chain as this clutch will slip on any excessive sudden load. The capstan proper is installed on the main deck with the electric motor and reduction gearing on the deck below. It has planetary gearing, giving two speeds and two powers, with one direction of barrel rotation; so that the slack line can be taken in smartly or a greater pull at lower speed be cut in if necessary. All gearing is enclosed in oil-tight gear case and runs in an oil bath. The worm is fitted with SKF ball thrust bearings. Another interesting point from the standpoint of the Pacific Coast is that the capstan shaft bearings and the pinion bearings are made of the new Shaw metal manufactured in San Francisco and distributed by the International Metal Sales Company. This metal makes a practically non-freezing bearing and is especially valuable in capstan and winch bearings on account of the tendency to neglect lubrication of this equipment. This particular capstan is known as the Cunningham reinforced type, the capstan barrel rotating on a steel column bolted on the base with the drive shaft floating inside the column. This method of construction has taken most of the troubles out of capstans, eliminating all bending stresses from the drive shaft and the consequent distortion of gearing.



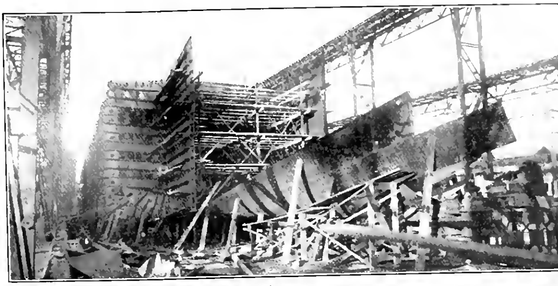
General Electric, double-armature, 240-volt propulsion motor for the Tide Water oil tanker, 1000 shaft horsepower at 130 revolutions a minute.



INBOARD PROFILE AND GENERAL ARRANGEMENT PLANS OF DIESEL TANKER CALIFORNIA STANDARD.

Length overall	530'0"	Beam moulded Shelter Deck	66'4 7/8"	Draft moulded designed	28'3 3/8"
Length between perpendiculars	512'0"	Beam moulded frames	67'11"	Deadweight capacity	16,000 tons
Length water line	516'8 9/16"	Depth moulded	39'5 1/4"	Gasoline cargo capacity	130,000 bbls.

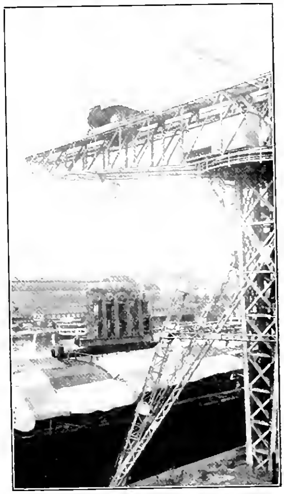
California Standard, New Motor Tanker

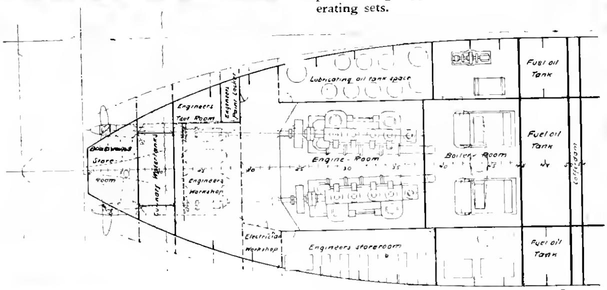


Typifying Standard Oil efficiency and German thoroughness, the California Standard, diesel-driven, bulk gasoline tanker built by the Krupp yards at Kiel, Germany, for the Standard Oil Company (Calif.), has been receiving much favorable comment from the naval architects and marine engineers of the San Francisco Bay region.

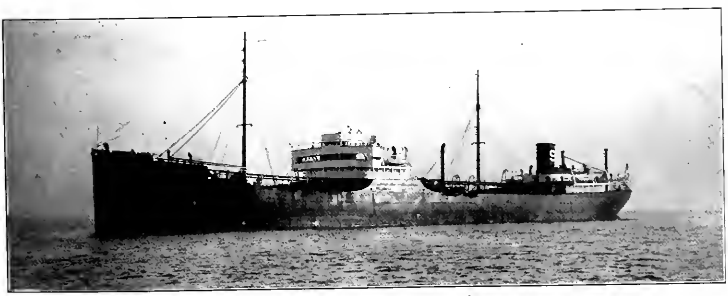
The general characteristics, inboard profile, and deck plans reproduced on facing page show clearly the distribution of cargo tanks, location and arrangement of cargo pumps, and commodious, modern accommodations for officers and crew. The partial plan below shows arrangement of engine and boiler room spaces.

The two main propulsion engines are Krupp, 4-cylinder, single-acting, 2-cycle diesels, each developing 1600 brake horsepower. All auxiliaries in the engine room, tools in workshop, steering gear, capstans and cargo winches are electrically operated, power being supplied by Krupp diesel generating sets.





Since this tanker is to be operated in the Pacific Coast-European run carrying gasoline, her cargo pumps are steam actuated. These pumps were built and supplied from the Worthington Works in Berlin. Their capacity is amply sufficient to load or discharge the tanker in twenty hours. Steam for these pumps is supplied by two Krupp water-tube boilers equipped with Ray rotary tanks, location and cargo arrangement steam turbine driven oil burners furnished by the W. S. Ray Manufacturing Co. of San Francisco.



The California Standard is built on the new Isherwood Bracketless System. She is equipped with Sperry gyrocompass, "Metal Mike," and course recorder.

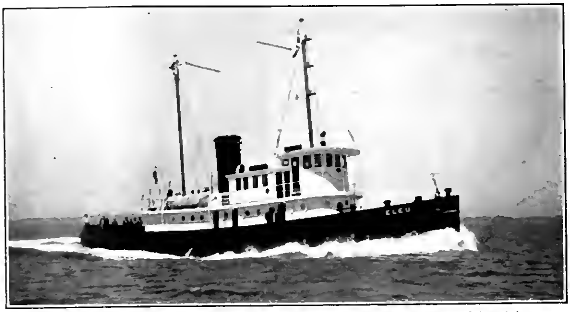
De Laval vapor-proof oil purifiers take care of the lubricating oil.

Ocean-Going Tugboat Eleu Delivered

Steel Twin-Screw Diesel-Driven Towboat Built by the Union Plant, Bethlehem Shipbuilding Corp., Ltd. for the Inter-Island Steam Navigation Co., of Honolulu

UNION Plant, Bethlehem Shipbuilding Corporation, Ltd., San Francisco, recently delivered to the Inter-Island Steam Navigation Company, Honolulu, a steel, twin screw, diesel engined tug for inter-island service. This tug, christened Eleu, has the following general characteristics:

Length over-all	125′0″
Length between perpendiculars	117′0″
Beam, molded	28′0″
Depth, molded	16′0″
Draft	13′0″
Trim by stern	32″
Shaft horsepower on twin screws	1120
Speed on trial, knots	11.4



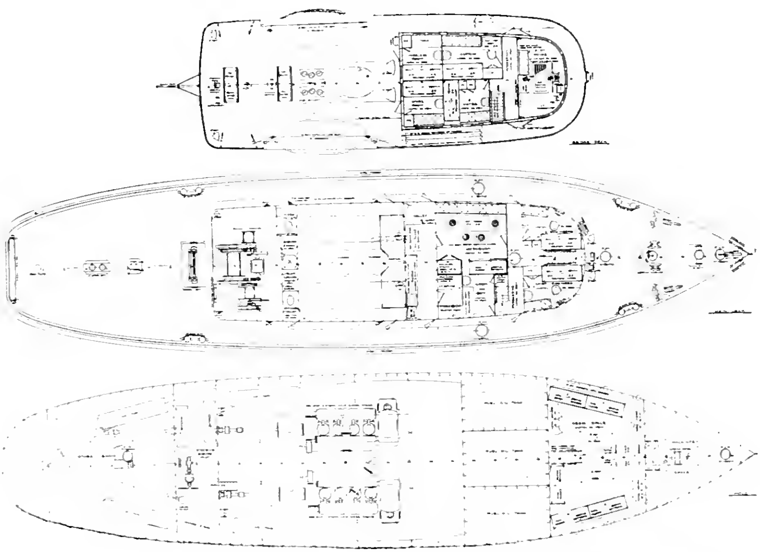
The tug Eleu on her trials on San Francisco Bay. This vessel was acclaimed by many of the old timers as being the handsomest tug that had been built in a Bay shipyard.

The hull of the Eleu is arranged and subdivided as shown in the plans reproduced herewith. The pilot house and rooms above the steel deck house are of pine with all outside doors and door trim in teak; all inside doors in oak. Officers' quarters are in the deck house and the crew's quarters forward. The latter are fitted with ten sanitary pipe berths and ten steel clothes lockers. All accommodations have the steel deck covered with Linatol.

The galley is equipped with Ray oil burning range and with Frigidaire refrigerator.

Machinery

Two 560-brake horsepower Fairbanks-Morse C-O diesels drive the boat through direct connection to twin screws. These are 4-cylinder 16x20, 2-cycle, solid injection engines and are figured to run at 250 revolutions a minute normal speed. The auxiliary diesel generating set providing light, starting air, and



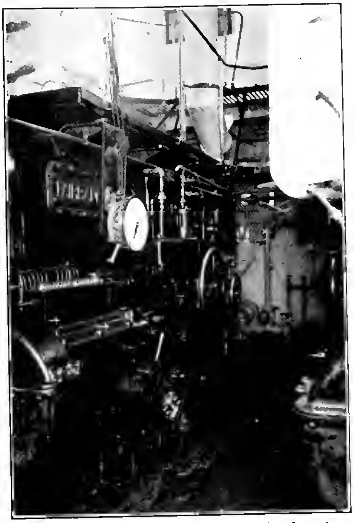
General arrangement plans of the steel tug Eleu showing the crew accommodations and arrangement of machinery.

auxiliary power is a 60-horsepower Fairbanks-Morse C-O diesel driving a 40-kilowatt, 125-volt Fairbanks-Morse generator and a Fairbanks-Morse compressor, 6¼ by 3-1/8 by 5¼ inches, with a capacity of 50 cubic feet per minute at 250 pounds per square inch. All of the service pumps are of Fairbanks-Morse manufacture and are driven by Fairbanks-Morse motors.

A De Laval oil purifier takes care of the lubricating oil for the diesels. An adequate supply of fresh water for the galley and for drinking purposes is assured by a Westco automatic system with a capacity of 250 gallons per hour.

On the pilot house and bridge we noted the installation of two Lietz compensating box compasses, Cory engine room telegraphs, Cunningham whistle, Cunningham electric steering gear and telemotor. The windlass and the towing engine are also of Cunningham manufacture. For emergency light and power purposes there is installed a battery of 96 Edison A-8-H cells.

The Bethlehem plant also delivered, along with the Eleu, a large steel barge designed for carrying pineapples in the inter-island service. As an initial work-out prior to entering her regular service, the Eleu towed this barge over the long ocean lane from San Francisco to Honolulu.



Control stand in engine room of tug Eleu featuring simple and efficient control of the Fairbanks-Morse marine type diesel engine.

Some Pacific Coast Fireboats

Sterling Engined Pumpers Giving Good Satisfaction

AFTER observing the remarkable performance of the three Columbia River fireboats owned by the City of Portland, Oregon, the City of Tacoma authorized the bidders to include Sterling engines. The design of the Tacoma fireboat is from the board of Professor T. C. Rowland of Seattle, and the boat is being built by the Coast Line Shipbuilding Co. The length is 96 feet, beam 21 feet 6 inches, and the draft, when loaded with full equipment, will be 6 feet, making it possible for these boats to manoeuver in fairly shallow waters.

The Portland fireboats were reported recently as having extinguished a dock fire, a very difficult fire to fight because the flames were under the dock. The big Sterlings were speeded up to 1350 revolutions per minute, probably the fastest speed 8-inch bore 9-inch stroke engines have ever been run for duty, and the tremendous pressure developed was sufficient to knock the 4-inch thick plank docking loose so that the source of the fire could be reached.

The Portland fireboats are equipped with two 8-cylinder 565-horsepower engines and two 6-cylinder 425-horsepower engines, totaling 1980-horsepower per boat.

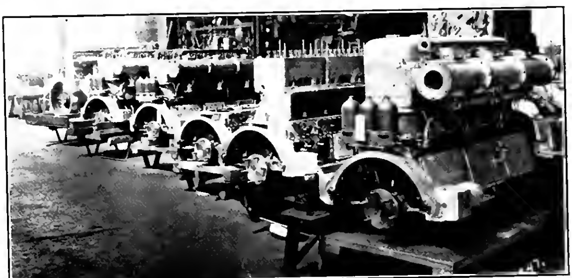
The Tacoma boat will have four pumping engines totaling 1800-horsepower and one main propelling engine. The hull speed can be augmented by two wing engines arranged for clutch connection to outboard propeller shafts, making a total of three engines on propellers when proceeding to the fire.

These are remarkable fire fighters. The Portland boats having greater horsepower, throw approximately 10,000 gallons per minute at 200 pounds pressure, and there are three of these boats. The Tacoma boat will handle about 10,000 gallons per minute at 180 pounds pressure.

Vancouver, British Columbia, launched a new fire boat with Sterling engines last year, also Wilmington, California, while Jacksonville and Norfolk built boats were Sterling powered a number of years ago.

Among the desirable attributes of the Sterling engine are: removable cylinder sleeve construction, dual valves in the head, counterweighted and dynamically balanced crankshaft, and oil cooler and filters.

The Sterling Viking II series of engines, 8-inch bore, 9-inch stroke, are among the largest engines ever constructed for a speed of 1200 revolutions per minute. The fact that they have shown utmost reliability on fire duty and are preferred for such duty, would indicate an equal ability for yacht power.



View of the shops, Sterling Engine Company, showing engines under construction for the Tacoma fireboat. These engines have been finished since this picture was taken and one of them was on exhibition by King-Knight Company of San Francisco at the recent Pacific Coast Motorboat Show held in San Francisco.

New Passenger Accommodations on Steamship President Adams

The social hall, shown above, is modified French style, with walls in cafe au lait, high-lighted in gold leaf, and drapes in peach damask hung from cornices finished in gold leaf. All wall and ceiling panels are Vehisote. At the left is shown a recess in one corner of this room with davenports in fine silk velvet and friezées. A special feature is the beautiful console table and mirror in elaborately carved walnut, high-lighted in gold leaf.

Picture at lower left is the bed room of the suite de luxe looking through to the reception room. These two rooms have been decorated with great attention to detail. The floors are covered with broad loom carpet in solid green shades. Furniture is all carved walnut. The chairs in the reception room being of the directoire design covered in exquisite shades of sienna and gold and studded with antique nails.

Elegantly Simple, Modern Home Atmosphere Emphasized on Dollar Round-the-World Passenger Liners

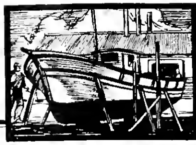
SMOKING ROOM

Enlarged and remodeled in its entirety, the smoking room on the President Adams is finished in light artichoke green smooth Vehisote wall panels, which make a charming combination with the interesting Goodyear rubber tile flooring pattern in medium red brown and terra cotta. The chairs are of hand-made carved walnut covered with soft top grain green morocco leather. The radiators are transformed into handsome console tables with bronze grille screens. The fire place, shown at left, is of handsome design in hand-carved walnut mantel with black and gold marble facing and with a handsome pair of Nubian lion andirons flanking the Magic Coal grate.

DINING ROOM

The dining room on the President Adams is shown at the right and left. This room is fitted with tables of various sizes for 2, 4, 6, or 8 persons, and in its decoration and color scheme carries out the intimate home dining room atmosphere. The walls are in flesh colored Vehisote, and drapes aqua marine taffeta. The floor is in a handsome design of Goodyear rubber tile.

This room will accommodate the entire first-class passenger list at one sitting. All design and execution of the interior decorations, drapes, and furnishings of the new passenger accommodations on the President Adams were by A. F. Marten Company of San Francisco.



Workboats and Their Power Plants

Pacific Workboat Notes

The Martin Newall booth at the San Francisco Motorboat Show, with its Tubbs Cordage exhibit under the charge of Cappy Chittenden, a veteran yachtsman and interesting marine character, was one of the high spots in the exposition.

More than 200 seine boats are ready to operate in fisheries tributary to Puget Sound waters this year, in addition to 400 trollers and 300 halibut boats. Twenty-two seine boats are being built at various yards in Tacoma for Alaska and California interests. This season the Port of Tacoma constructed a fishing dock at the port piers at a cost of $15,000 to house the fleet moored there, in addition to a new net house on the property. Approximately $10,000,000 annual income is represented by the Puget Sound fishing fleet. Practically the entire fleet is propelled by internal combustion motors, either diesel or gasoline.

The J. M. Martinac boatyards at Tacoma have succeeded in setting what is believed to be a record for the entire Pacific Coast in the number of boats built during the first five months of 1929. By the first of June fifteen commercial craft costing from $20,000 to $35,000 each have either slid down the ways or will be in process of completion. Tucked away between two great swing bridges on the city waterway, J. M. (Joe) Martinac and his crew of boat builders are operating a yard which, though not very large in area, fairly bristles with activity. Just back of the yard are the plants of the Wheeler Osgood Company and the St. Paul and Tacoma Lumber Company, with ample supplies of the finest ship timber. Last month a piece of clear fir, 12x12 and 84 feet long, was cut from a Cascade forest giant and promptly found subsea quarters as the keel of a heavy purse seiner. During the week of May 6, keels were laid down for Hulls 29 and 30, purse seiners.

Hull 29 is for **Rudolph Franulovich** of Anacortes and will be 56 x 15 x 7 feet and powered with a 500-horsepower **Washington-Estep**, 3-cylinder, diesel. She will be used in Alaska waters.

Hull 30 is for **Paul Martinis** of Everett, also a purse seiner of 76 feet length, 18.6 feet beam, 9 feet depth, and will be powered with a 165-horsepower **Washington-Estep** diesel.

Buchen and Heinen Packing Company of Port Armstrong, Alaska, has ordered from the Martinac yard a seiner of 70 feet length, 17 feet beam, 8.6 feet depth, which will be powered with a 120-horsepower **Viking** diesel of the new type being built by the Markey Machinery Company in Seattle.

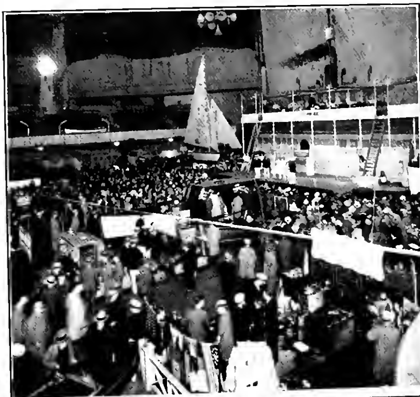
Tony Cordich of Tacoma has ordered for completion by the end of June a seiner of 56 feet length, 15 feet beam, 7 feet depth, to be powered with a 40-horsepower **Frisco-Standard** of the old reliable type which has done duty in another of Mr. Cordich's fishing boats.

Tony Slessa of Monterey, California, has ordered a 76-foot seiner which will carry a 165-horsepower **Atlas-Imperial** diesel.

The Lake Union Dry Dock and Machine Works, Seattle, have completed work on the cruiser Reliance, a gasoline driven ship of 45 by 11.6 by 3 feet, powered with a **Redwing** engine of 100 horsepower, which gives her a speed of about 14 knots. Pilot house control, 540 gallons gasoline storage, and sleeping accommodations for seven all make her an ideal little ship for shallow draft, long cruising radius work which she will encounter in her work on the Bering Sea, Yukon River, Tanana River, and Norton Sound. She is owned and operated by the National Grocery Company of Seattle as a

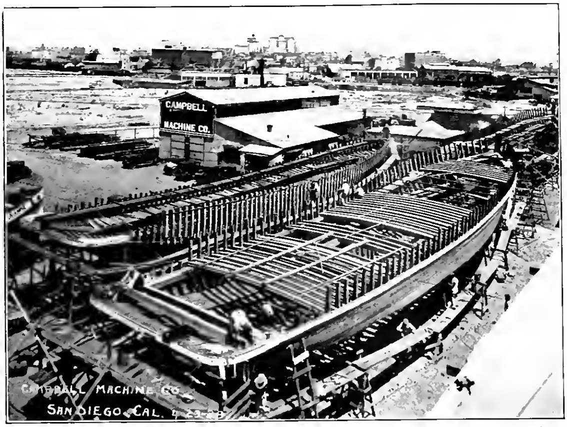
From an educational standpoint, the exhibit of John Twigg and Sons at the San Francisco Motorboat Show was in a class by itself. It is a transverse half-section of a 92-foot yacht as built by Twigg, with auxiliary engine in place and with several other fittings attached. A crowd of amateur boatbuilders would be found examining carefully this interesting construction on almost any afternoon or evening.

First Pacific Coast Pleasure Boat and Sportsman's Exposition



The pleasure boat show sponsored by the Associated Boat Industries of Northern California, from both educational and financial viewpoints, was an unqualified success. We show above a general view of part of exposition and close-ups of several of the booths. These pictures by no means begin to tell the story, but they do represent in a fair way the character and quality of the exhibits. This show will be an annual affair, and space for 1930 is already oversubscribed.

From top to bottom: At left, a general view of crowd in front of the "Show Boat"; the Julius Brunton booth featuring Willard storage batteries; and the general ship chandlery booth of Johnson, Joseph, and G. M. Josslyn & Co. Right, the Haviside booth, featuring boat hardware, chandlery, plumbing, and sails; Geo. W. Kneass booth, with speed boat and cruisette; Ets Hokin & Galvan booth, featuring marine engineering specialties, including Exide storage batteries.



This interesting picture shows three large fishing boats in frame at the yard of the Campbell Machine Works, San Diego, California. Two of these hulls are each to be powered with a 400-horsepower, 6-cylinder, Union diesel engine and a 45-horsepower Union diesel generating set; the other is to be powered with a 350-horsepower, 7-cylinder Union diesel engine and a 30-horsepower Union diesel auxiliary generating set.

Another 300-horsepower, 6-cylinder Union diesel and a 30-horsepower Union diesel generating set have been sold by the Campbell Machine Works and are being installed by them in the hull of the Mariner, which was rammed and nearly sunk a few months back by an oil tanker.

commercial salesman's floating headquarters for conducting wholesaling business during the open navigation season. She leaves June 15 on the Tanana, of the Alaska Steamship Line for Nome. Captain David E. Dunbar, veteran Yukon skipper, will command the new ship. Formerly he operated the Sea-Nat on the same routes for seven years.

Dr. W. F. Good, Seattle, is completing the cruiser Anna Helen, a 70-foot ship with 17-feet beam and powered with a 100-horsepower **Washington-Estep** diesel, for special summer excursion work along the Alaska peninsula from Seward. The ship will mainly carry passengers from Seward to Katamia National Park, or the Valley of Ten Thousand Smokes.

Mojean and Ericson, Tacoma, recently delivered the fast cannery tender-towboat the Shelikof to order of the **Northwestern Fisheries**, Seattle, for duty in the Bering Sea. The big ship is 80 by 14 by 6 feet and is powered with a 200-horsepower, 6-cylinder **Washington-Estep** diesel and is electrically equipped throughout and capable of long voyages in the very shallow waters, as are encountered in Bering Sea navigation. **H. C. Hansen** of Seattle designed her.

The Northwestern Fisheries also have two other boats which were recently delivered by the Mojean and Ericson yard, the Karluk and the Howkan, twin-sister ships, 45 by 14 feet, each powered with 30-horsepower **Frisco-Standard** gasoline engine, and mainly operated as purse seiners in Alaska waters. The Booth Fisheries control the Northwestern Fisheries, which is the cannery subsidiary organization.

Western Boat Building Company, Tacoma, is completing work on two big cannery tenders for the **Northwest Fisheries** Company, making five large fishing vessels that will be added to the fleet during 1929. These boats will be 83 feet long, 19.6 feet beam. One will be powered by a 200-horsepower **Atlas-Imperial** diesel engine; the other with a 200-horsepower, 6-cylinder **Washington-Estep** diesel.

Emel Packing Company has ordered from this yard a 76 by 18 foot cannery tender, to be powered with a 135-horsepower Atlas-Imperial diesel.

This yard is building a halibut boat for **Chris Hall**, to be 63 by 16 feet and powered with a 90-horsepower Atlas-Imperial diesel engine.

Other jobs recently completed were two large purse seiners for the Nootka Packing Company of Vancouver, British Columbia, each powered with a 100-horsepower Atlas-Imperial diesel. Four others of similar design are also being built at the Western Boat Building Company's yards.

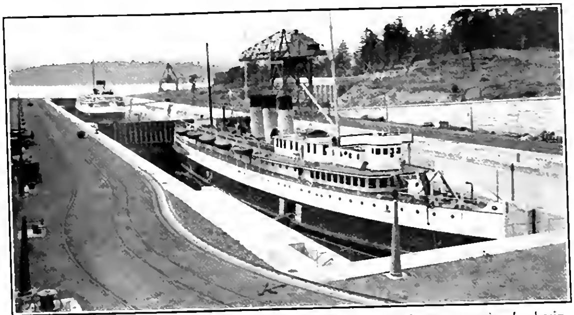
At the recent Motorboat Show held in San Francisco, the U. S. Coast & Geodetic Survey had on display, as part of its exhibit, sextant mirrors made of stellite, a steel alloy. The Service has used these for several years and find that they give very satisfactory service as they are unaffected by salt spray and water.

Many inquiries were made regarding these by spectators.

Dirigold is becoming very popular table ware for pleasure cruisers and yachts as well as for passenger steamers. The above picture illustrates a few of the types and forms of loving cups, trophies, and table were exhibited by Dirigold Corporation at the Boat Show.

Our Canadian Neighbors

The Harbors of Victoria, British Columbia



The Esquimalt dock, with two crack Canadian Pacific coastwise steamers in the basin.

IN talking of Victoria as a port, one should really use the plural, for Victoria has three excellent harbors; the Outer Harbor, comprising Rithet's wharves, with an area of 16 acres, and the Canadian National Docks at Ogden Point (these covering some 30 acres); the Inner Harbor; and the famous Esquimalt Harbor, 940 acres in extent. The Outer Harbor and Esquimalt are used chiefly by ocean-going ships, the Inner Harbor by coastwise vessels. Besides these harbors, safe sheltered anchorage can be found in the Royal Roads off the entrance to Esquimalt Harbor.

The Outer Harbor docks are able to berth any ship afloat, and all vessels can enter and leave under their own steam. The Ogden Point docks have two piers, protected by a solid granite breakwater 2750 feet long. One side of the pier, nearest the breakwater, is 1000 feet in length; the other side, and the sides of the adjoining piers are each 800 feet. The width of each pier is 250 feet separated by a minimum depth of 38 feet at low tide. These piers have a warehouse space of 180,000 square feet, fresh water hose connections every twenty feet, good passenger accommodation and conveniences. All berths on Pier A are fitted with floating fender logs and the corners of both piers with spring buffers. As both piers are constructed of solid stone and cement they will carry any weight. There is ample berthage for eight ocean-going vessels.

Besides other merchandise, over 12,000,000 feet of lumber was shipped from the Ogden Point docks during the last twelve months, and the Canadian National Railroads, who manage them for the Canadian government, have now organized at these docks a lumber assembly plant for the whole of Vancouver Island, the lumber resources of which are over 127 billion feet.

Rithet's Wharf, the other section of Victoria's Outer Harbor, comprises three wharves, with from 27 to 33 feet of water. No. 1 wharf has a length of 688 feet by 100 feet wide and a shed 541 feet by 60 feet, with a carrying capacity of 16,000 tons. At the ends of the sheds are open spaces for rough freight of 58,000 feet and 10,500 feet. Five slips give ample facilities for handling cargo through ships' ports. No. 2 Wharf is 1050 feet in length by 125 feet in width, with shed 818 feet in length, varying in width from 59 to 90 feet; floor area, 68,000; carrying capacity, 13,000 tons; open space at ends of shed, 21,500 and 18,000 for rough freight; depth of water, 31 feet; space between wharves, 190 feet. There is also berthage of 300 feet frontage where small vessels can be made fast in 25 feet of water, and two sheds, respectively of 20,100 feet, storing about 4000 tons, and 8000 feet, storing 1800 tons.

The Inner Harbor is used chiefly by coastwise vessels; but sailing ships and large steamers also enter it. On its northwest shores are 80 acres of industrial sites, with railroad and trackage facilities and water frontage. These sites are owned by the Provincial Government.

Two views of the inner harbor of Victoria, British Columbia. Above, taken in 1890; at right, showing developments to date.

Puget Sound Marine Notes

The steamer City of Victoria of the Edmonds-Victoria Ferry Company, put into the Todd Dry Docks, Inc., Seattle, early in May to undergo a complete overhauling and general remodeling, preparatory to being placed on the new Edmonds (Washington) — Victoria (British Columbia) double daily service early in June. The alterations planned by her owners call for an expenditure of about $60,000, which includes the construction of a glass-enclosed observation salon, 25 by 40 feet in size forward on the upper deck, remodeling of the whole interior, and extensive repairs to her machinery.

The City of Victoria is 293 feet 8 inches long, 54 feet beam, and 16 feet depth, of about 1900 gross tons. Her triple expansion engine, of 3000-horsepower, gives her an operating speed of about 16 knots. She has sleeping accommodations for 278 passengers and carries 750 on day runs, as well as 65 automobiles. So successful was her first season during 1928 on the new short run from Edmonds, just 12 miles north of Seattle, that her owners decided to remodel her and make the run a permanent one starting with the 1929 tourist season.

The Port of Tacoma called for bids on May 10 for a new cold storage warehouse adjoining the transit shed on Pier 2 to be completed in time to care for the 1929 apple crop. The new warehouse will be a concrete and steel structure, 189 by 130 feet and four stories high, costing about $200,000 and equipped with modern mechanical refrigeration. It will be connected with the main transit shed by conveyors and cranes to facilitate the movement of stored fruits.

The W. B. **Foshay** interests of Minneapolis succeeded in putting over a very important marine transaction for Puget Sound when, on May 8, the Kitsap County Transportation Company and the newly formed Sound Freight Lines, both of Seattle, were bought and merged by W. B. Foshay into one large operating company. This transaction involves a fleet of five big ferries and 18 fast passenger and freight vessels serving practically all ports of Puget Sound. Captain John L. Anderson, founder and president of the Kitsap County organization, and Captain F. W. Lovejoy, who founded the Sound Freight Lines, which early in April acquired the entire business and fleet of the Merchants Transportation Company, jointly made public the announcement of the new combine.

The Foshay investment in this merger is over $1,000,000. The Foshay interests already operate Alaskan steamship service and are now building a $300,000 steel motorship at the Lake Washington Shipyards for the Puget Sound-Alaska trade.

The great Kitsap Peninsula is served throughout its length by the passenger and freight lines of the new concern as well as by three of its ferry routes. Plans for a large new ferry are expected to be released at any time.

The Foss Launch and Tug Company, Tacoma, has recently finished work in its yards on the trim little motor tug Drew Foss, built for heavy duty in the bays and inlets of the Straits of Juan de Fuca. She is powered with a 120-horsepower Fairbanks-Morse diesel of four cylinders and went into service April 18.

The same company is also speeding work on the conversion of the large seagoing tug, Andrew Foss, from steam to diesel operation. She is 97 feet 4 inches by 27 feet 9 inches by 9 feet and was formerly powered with a 350-horsepower steam plant. Her new power will be a 400-horsepower 6-cylinder **Busch-Sulzer** diesel, and she will be equipped with steam heat, hot and cold running water, and a **Frigidaire** cooling system of the latest design. She is intended for offshore duty and heavy towing upsound.

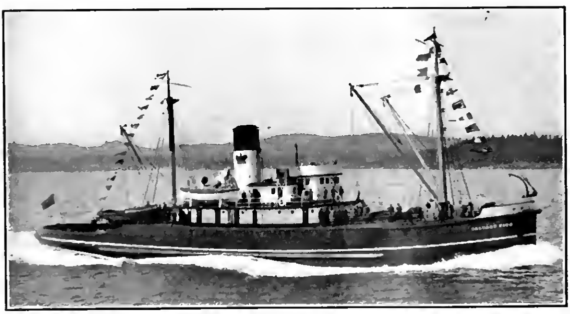
The small tug No. 11, recently wrecked in a collision with a barge near the Straits of Juan de Fuca, is also being repaired at the Foss yard.

The Foss Launch and Tug Company operates one of the largest towing systems on Puget Sound, having 25 ships in its fleet, of which 20 are diesel powered. Within a year or two, according to H. O. Foss, manager, practically all steam equipment will be replaced by diesel.

TRADE NOTE

George S. Lacey, of San Francisco, manufacturers' representative, who makes a specialty of marine products, has been appointed by L. W. Ferdinand & Co., Boston, distributor of **Jeffery's Marine Glues** and manufacturers of Ferdico products as their Pacific Coast representatives.

While L. W. Ferdinand's business on the coast is being ably taken care of by their local jobbers, the increase in the demand and the use of marine glues has become so great the last few years that they felt that a personal representative was necessary to better serve the territory. It will be Mr. Lacey's concern and pleasure to educate the trade to the uses of the different kinds of marine glues and their particular applications.



Tug Salvage King, owned by Pacific Salvage Company of Victoria and Vancouver.

Port of Olympia Shows Remarkable Growth

By Charles F. A. Mann

DURING the past decade there has been a tremendous growth in the Puget Sound region both in the number and variety of its industrial establishments and in its ocean commerce. Not a mere statistical growth; but a self-evident, proved growth shown by the great influx of deep sea ships from many nations. The Pacific Coast of the United States is fortunate in being gifted with four focal points from and to which ships of every maritime nation carry cargoes. The furtherest north of these points, Puget Sound, has since the early forties sprawled its commerce over its 3400 miles of shoreline like a lazy octopus. Town after town has seen its day as the site of a mill and a dock. One product and one cargo to load. But since the revival of Pacific Ocean shipping with opening of the Panama Canal, a great change has come over the development of Puget Sound terminal facilities, and some of its ports are leading the world in certain phases of port operation.

For many years, Olympia, the capital of the State of Washington and southernmost point on Puget Sound, peacefully dreamed on the hill above the southern end of Hood's Canal, 200 miles by water from the sea entrance to Puget Sound. Her oyster beds and lumber mills yielded a nice annual revenue and trainloads of lumber from the interior of the coastal shelf went by her doors daily on the main line in the tunnel under the city to ports down-sound, while dozens of barges towed the locally cut lumber to down-sound ports and nobody thought of moving the oyster beds and building an ocean wharf.

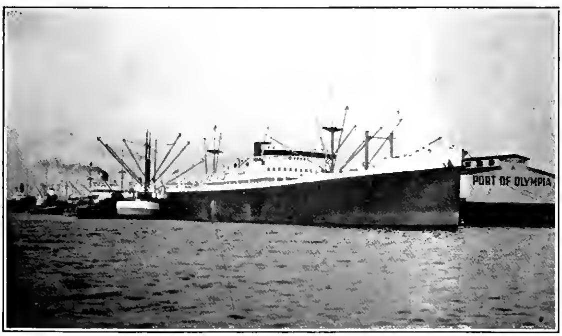
Six or eight years ago, definite plans for the magnificent new capitol building were formulated by the Capitol Commission. The oyster beds were moved into another bay further west because the growing city polluted the waters. Tumwater, neighboring suburb, long famous for its beer, was converted into a paper mill, and the port idea was born at last!

After hard work by prominent Olympians, late in the fall of 1926 the Port Commission of Thurston County officially began operations as the Port of Olympia with one small wharf and loading dolphin, mainly loading lumber. Shortly afterwards, E. C. Gribble, formerly with the Port of Tacoma, joined the port organization and started things going. In just over two years from a very small beginning, the port has reached a high peak of success. During 1928, 207,000,000 feet of lumber was loaded over the port piers besides 8300 tons of general cargo. From one or two local lines, the shipping services have grown until they now total eleven, reaching to all ports of the world, with many more due to begin service this summer.

The Port of Olympia began operations on thirty acres of land, but it is extending to include 150 acres of wharfage and industrial property. The present equipment includes a main dock 1834 feet long, equipped with double shipside tracks and cross-overs every 200 feet; transit shed of 3000 tons capacity equipped with a marine elevator of 10 tons capacity; another transit shed to be completed by June 15, with a capacity of 3000 tons; and cold storage to be completed June 15 with capacity of 4100 barrels of berries and 30 carloads of miscellaneous products.

The Port owns and operates all trackage and owns a locomotive crane, a fleet of tractors, stackers, and trailers, besides a switch engine.

Olympia lies at the heart of a highly productive region, rich in agricultural, mineral, and lumber resources. The commissioners under whose jurisdiction the port is operated are Fred W. Stocking, president; P. F. Knight, secretary; and Peter G. Schmidt. Ernest C. Gribble is manager, George F. Yotis is counselor, and E. L. Van Epps is auditor.



A busy day at the Port of Olympia Terminal.

Auxiliaries—Ship Supplies—Marine Equipment

Electric Equipment for Coast Guard Cutters

THE Westinghouse Electric and Manufacturing Company has received an order for the complete turbine electric propulsion equipment with the motors and control for all auxiliary machinery for three new turbine electric coast guard cutters. These cutters will be built by the General Engineering and Dry Dock Company of Oakland, California, and will be similar in hull and machinery particulars to the five Westinghouse-equipped turbine electric cutters, Champlain, Chelan, Pontchartrain, Tahoe, and Mendota recently put in service.

Each cutter will be propelled by a 3200 shaft horsepower synchronous motor of 60 cycles, 2300 volts, at 163.5 revolutions per minute. Power for the propulsion motor will be supplied by one main turbine generator unit of 2460 kilowatts, operating at a speed of 3600 revolutions per minute.

The main turbine driving this unit is of the well-known Westinghouse combination impulse and reaction type designed for operation at 250 pounds steam pressure, 175 degrees superheat, and 28½ inches vacuum. The turbine has two bearings and is connected by means of a solid coupling to the main generator. The impulse element of the main turbine carries two rows of moving blades and one row of stationary blades. The reaction element consists of twenty-two rows of moving blades and twenty-two rows of stationary blades.

In order to obtain the best steam economy, four nozzle blocks are provided, each containing a number of nozzles. These nozzle blocks are used in pairs, one pair being used for slow speed and the other pair for high speed.

The generation of auxiliary power in these new cutters differs from the Chelan class in that there is no dual drive arrangement. There are two 3-unit auxiliary power sets each comprising a turbine, an alternating current generator, and a direct current machine. There is also a 2-unit auxiliary power set which consists of an alternating current generator and a turbine.

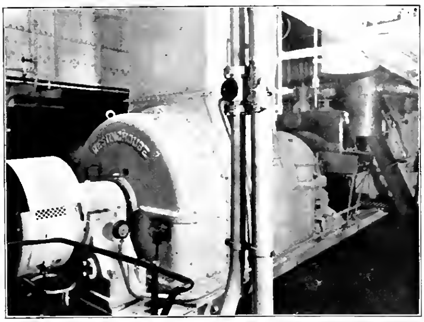
A main condenser and an auxiliary condenser with attendant equipment are provided with the usual control panel and auxiliary switchboard for the distribution of power to the deck and underdeck auxiliaries and lighting circuits.

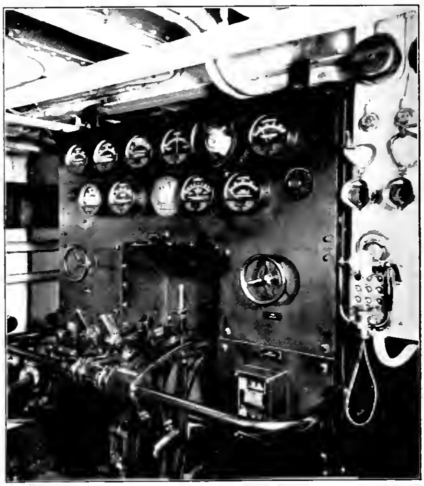
The following alternating current motors with control will be supplied to drive underdeck auxiliary machinery:

One main circulating pump motor of 25 hp.

One auxiliary circulating pump motor of 10 hp.

One sanitary pump motor of 10 hp.





The United States Coast Guard Service is thoroughly sold on the advantages of the electric drive and, in cooperation with Westinghouse Electric and Manufacturing Company, the engineering personnel of that service have been perfecting the so-called central station type of turbo-electric marine propulsion machinery.

The three Coast Guard cutters now being built by the General Engineering & Drydock Company of Oakland, California, will be equipped with the latest form of this drive, which will be practically identical to that installed on the Chelan, whose turbo-generating plant is shown in the picture above, with a close-up of the control board in the engine room at the right.

One bilge pump motor of 10 hp.

One fuel oil pump motor of 5 hp.

Two lubricating oil pump motors of 3 hp. each.

One refrigeration machine motor of 5 hp.

One evaporator feed pump motor of 1 hp.

One fresh water pump motor of 1 hp.

One lathe motor of 2 hp.

One drill press motor of 1 hp.

One fire pump motor of 25 hp.

Two main condensate pump motors of 3 hp. each.

One auxiliary condensate motor of 1 hp.

Alternating current motors and control will also be supplied for the deck auxiliary machinery, which comprises:

One steering gear of 15 hp.

One anchor windlass of 30 hp.

One capstan of 30 hp.

These motors will be installed in exposed positions and will, therefore, be of the water-proof type.

Electric Deck Machinery and Steering Gear for New Coast Guard Cutters

THE three turbo-electric United States Coast Guard cutters now building at the Oakland, California, plant of the General Engineering & Drydock Company, are to be fitted with steering gear, windlass, and capstan by the American Engineering Company, and it is characteristic of the engineering policy both of the Coast Guard Service and the American Engineering Company that this apparatus should show some features decidedly in advance of the practice on former Coast Guard cutters.

The steering gear is of the four ram, electro-hydraulic type and is installed aft on the main deck. The rams operate a double jaw balanced tiller keyed to the rudder stock, and are themselves actuated by a Hele-Shaw variable stroke hydraulic pump driven through suitable gearing by a Westinghouse 15-horsepower, 230-volt, alternating current motor controlled by a 30-inch wheel on the steering stand in the wheel house.

In these new cutters, an innovation has been introduced in connection with the emergency hand steering gear. Formerly this has been accomplished by means of a worm and quadrant at the rudder stock connected by gearing and shafting to hand steering wheels located in the steering gear department. With this gear it had been found very difficult, in fact practically impossible, to operate the rudder through its full range from hard over to hard over.

In cooperation with the engineering personnel of the Coast Guard Service, the American Engineering Company has worked out a very efficient scheme for emergency hand steering on the new cutters. It consists of a duplicate Hele-Shaw variable stroke hydraulic pump arranged to be worked at low pressure and driven through spur gearing by the hand wheels. With two 5-foot 6-inch diameter hand wheels using this hydraulic connection, the rudder can be put from hard over to hard over with 45 turns of the wheels, and with an effort at no time exceeding a 50-pound pull on the periphery of the hand wheel. This not only gives a very efficient type of emergency hand steering gear, but also provides a stand-by Hele-Shaw pump which can be coupled up to the motor and used in place of the regular pump in the event of any mishap.

The windlass is designed to take $1\frac{3}{4}$-inch stud link chain and is arranged in the conventional manner with two wildcats on a horizontal shaft installed forward on the upper deck. Its specifications call for hoisting one 4000-pound anchor with 45 fathoms of chain cable at the rate of six fathoms per minute. The windlass is driven by a 30-horsepower, 230-volt, Westinghouse, alternating current motor through cut spur gearing totally enclosed and running in an oil bath. Warping heads at either side of the windlass are of extra large size and may be operated independently of the wildcats.

The electric capstan is located on the upper deck aft near the towing bits. It has a 20-inch diameter warping head and is driven by a Westinghouse 30-horsepower, 230-volt, alternating current motor through a bronze worm operating on a cast steel worm wheel in an oil bath. This gypsy is capable of exerting 17,000 pounds pull at the rate of 50 feet per minute.

The American Engineering Company is represented in California by Hough & Egbert of San Francisco, who are ready at all times to confer with shipowners on their deck auxiliary problems.

View of the after deck of the cutter Chelan, showing the American Engineering Company's capstan driven by Westinghouse motor.

California Marine Oil Terminal

MARINE terminal facilities of oil producers in the Los Angeles district are undergoing a considerable development at this time, according to Merritt-Chapman & Scott Corporation, New York contractors, through whose Los Angeles organization a substantial volume of such construction is being carried on.

The company is now at work for the Rio Grande Oil Company on a marine oil terminal at the oil Company's property on Channel No. 2, Long Beach, to handle the big production in the new Santa Barbara field as well as refinery products pumped sixteen miles to Long Beach. The project will represent an investment of more than $2,000,000 when completed some time this fall and is expected to be one of the finest and most modern on the Pacific Coast.

Dredging of the channel in front of the 14 acres of property has been completed by the Merritt-Chapman & Scott Corporation, whose contract also covers the construction of the wharves and the substructures for the terminal. This includes pile foundations for twelve tanks, ranging up to 118,000 gallons capacity, as well as a 20-foot fire wall, 8 inches thick, both about 60 per cent completed. The wharves are two in number: one, of the double-deck type, 40 by 250 feet, and a smaller one 40 by 140 feet.

At Elwood, California, two other projects are under way. One is a development for the Honolulu Oil Company, embracing a 1000-foot pier, a 1900-foot trestle, various well wharves and derrick foundations. The other is a similar and equally extensive project for the Bank Line Oil Company.

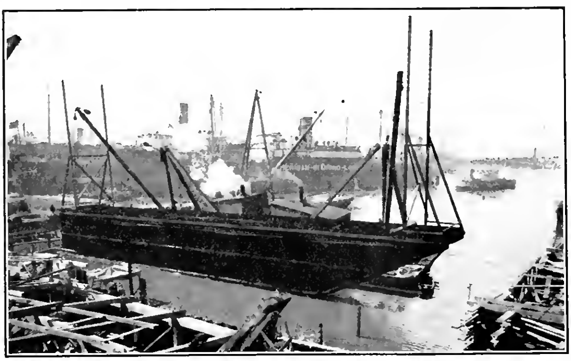
Merritt-Chapman & Scott engineers and divers are also making an ocean survey at Sea Cliff, California, off Santa Cruz, for the General Petroleum Company, preparatory to the installation of sea loading lines.

When Night Work is Advantageous

THE use of a portable acetylene light as an emergency measure is by no means confined to fire departments, wrecking crews, or similar organizations. Due to the present industrial expansion there is need today for such a light in many industries. Road contractors find the portable light a handy aid in night work where contracts must be completed rapidly or where a bonus depends upon finishing the job within a certain specified time. Excavating contractors keep their steam shovels busy on twenty-four hour schedule by means of portable flood lights. They find that the loaded trucks can make better time at night through deserted city streets. Many building contractors use the portable light on work which precedes the installation of electric wiring in the building. Stevedoring contractors and ship repairers often find that portable flood lights are of great assistance.

The needs of these men have been successfully met by the use of portable acetylene flood lights. These lights combine many distinctive features. They are extremely portable. Skilled labor is not required to operate them. When the light has been put in operation it requires no further attention until the charge is exhausted. The beam is far reaching and penetrates fog and smoke to a remarkable degree. It operates efficiently in rain or snowstorms and under torrid or frigid conditions. The steady acetylene flame resists winds of almost gale force.

In view of these features several types of portable acetylene flood lights are widely adopted as standard equipment by those who find night work necessary or advantageous.



Steel Tremie form being lowered into position to make part of the foundation for the outshore portion of the new Todd dry-dock.

TRADE NOTES

High Test Welding Rod, published by **the Oxweld Acetylene Company**, 205 East 42nd Street, New York, describes an improved welding rod for making stronger welds in steel.

This publication is divided into two major divisions, the first being reasons for specifying high test rod and the second how to use this rod to the best advantage.

Since steel is the metal most commonly welded, this booklet should be of interest to virtually everyone concerned with welding.

NEW TODD DRY-DOCK LENGTHENED 16 FEET

BY a slight change in design, the length of the big new graving dock at the Robins plant of the Todd Shipyards Corporation has been increased sixteen feet. This extension will give the dock on overall length of 745 feet, thus providing docking facilities for liners that have never been able to dry-dock in New York before.

Rapid progress in the work is being maintained. The side walls and cement floor on the inshore end of the dock are almost completed, dredging of the 250 foot outshore section has been finished, timber foundation piling driven, steel trusses and forms lowered and set in position by the divers to receive the cement.

Two New Diesel-Electric Shallow Draft Tankers

An order from the Sun Shipbuilding & Dry Dock Company for the complete electrical equipment for two diesel-electric tankers was recently obtained by the Westinghouse Electric & Manufacturing Company. The Sun Oil Company, to whose order the tankers are being built, will use these vessels for the distribution of gasoline along the New York State Barge Canal and for transportation purposes from Marcus Hook to Atlantic City.

The propulsion equipment of each tanker will comprise two Bessemer 6-cylinder, 4-cycle diesel engines, each directly connected to a 130-kilowatt, 125-volt, main generator of the new Westinghouse fabricated construction type. Also directly connected to each engine is a 20-kilowatt, 125-volt exciter.

The main propulsion motor will be of the double armature type, also of fabricated construction, and will be rated at 320-horsepower, 250-volts, at 180 revolutions per minute. The armatures of the motor will be assembled on their common shaft with their commutator ends adjacent instead of opposed as has been the former practice. This method of assembling was first used on the propulsion motor of the U.S. Coast and Geodetic Survey vessel Hydrographer and has now been adopted as standard because of the improved ventilation.

Control will be arranged for four stations, one in the engine room, one in the pilot house, and one on each wing of the bridge. Steering wheels will also be installed on each wing bridge as well as in the pilot house, so that the pilot may control the tanker from these three positions.

A great deal of auxiliary power will be required on these tankers. While operating on the New York State Barge Canal, gasoline will be discharged at intermediate points and, because of the number of low bridges which cross this waterway, it will be necessary to pump tanks full of water as gasoline is discharged. This calls for more than the ordinary amount of pumping capacity.

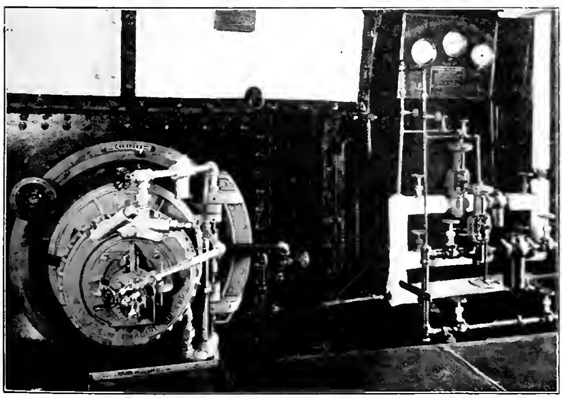
These tank barges are to be 188 feet 6 inches between perpendiculars, 31 feet breadth, 11 feet 6 inches depth, with capacity for 6000 barrels on 9-foot draft.

The Westinghouse company has had considerable experience in the design and manufacture of the diesel-electric drive for small tankers of this type. The 455-shaft horsepower tanker J. H. Senior of the Standard Oil Company of New Jersey, the 350 shaft horsepower tanker Richlube of the Richfield Oil Company, and the 350 shaft horsepower tanker General of the General Petroleum Company are all Westinghouse equipped.

TRADE NOTE

International Metal Sales Company of San Francisco, distributor of the Shaw (non-freezing) bearing metal, has recently appointed the Charles E. Low Company of San Francisco as marine sales agent in the San Francisco Bay section. Shaw metal for marine bearings is coming into increasing favor, especially in hard service and wherever difficulties with lubrication are encountered.

Ray Burners in World Wide Use



The Ray rotary oil burner, as manufactured in San Francisco, is blazing a trail in transportation service afloat that is fast becoming world wide.

When the California Standard, diesel driven tanker built at Kiel, Germany, came into San Francisco Bay recently, her boilers and her galley range were equipped with Ray burners installed in Germany.

The latest and most powerful river steamers on the Yangtze-kiang, China, are equipped with Ray Rotaries.

Our illustrations herewith show one of the latest self-propelled barges of the Mississippi-Warrior service, and part of the Ray oil burner equipment in her boiler room.

Trade and Organization Notes

SUPERCORE CORDAGE AVAILABLE AT SEATTLE.

SUPERCORE hawsers and tow lines, which are the latest development in Manila rope construction as manufactured by the Tubbs Cordage Company, are now available in commercial stocks at Seattle from the warehouse of the Portland Cordage Company in that city. Through arrangements with the Tubbs Cordage Company, the Portland Cordage Company will now be able to supply shipowners on Puget Sound, giving immediate deliveries of this remarkable rope.

All the desirable qualities of best Manila rope are inherent in the Supercore and in addition this rope is stronger by 20 to 30 per cent and is more durable, more flexible, and much easier to handle. These results are obtained by the use of a fiber core which minimizes internal friction and wear.

The Tubbs Cordage Company of San Francisco reports that Supercore hawsers and towing lines are now being specified on twenty-five steamship lines operating out of the port of San Francisco to many sections of the world.

NEW SHIPBUILDING YARDS BUILDING ELLIS BOATS

TEN boats are now building by Fox Brothers of New York at their new yard located at Maracaibo, on Lake Maracaibo, Venezuela. Two are for the Red D Line, two for the Creole Oil Company, subsidiary of the Standard Oil Company, and six are for the Venezuela Gulf Oil Company. All the boats are being built under the Ellis Channel System of steel hull construction and will be used as fuel carriers and deck barges to operate in South American waters.

At Seaford, Delaware, another new yard is operating at full time capacity. This one is owned by the Atlantic Ellis Channel System, Inc. Here is building another Ellis Channel barge for Merritt, Chapman & Scott Corp. At this yard five boats for the United States government, three fuel oil carriers, and two deck barges are also being built. Practically all work at this yard comes from owners who now have one or more Ellis barges in service.

Edward B. Pollister, new president of the Busch-Sulzer Bros. Diesel Engine Co.

BUSCH-SULZER CHANGES

At the annual meeting of the Busch-Sulzer Bros. Diesel Engine Company, St. Louis, August A. Busch was elected chairman of the board and Edward B. Pollister was appointed president, succeeding Mr. Busch. This promotion comes as the natural result of the long and very fine record achieved by Pollister in the service of the Busch-Sulzer Company, with which firm he has been affiliated since 1912 with the exception of two years during the World War, when he served as Captain in the United States Army Engineers. During this time Mr. Pollister has served as sales representative, manager of the Northwest sales division, general sales manager, general manager, and vice-president. In his new position he will continue to act as general manager of the company.

TRADE LITERATURE

A Positive-acting Oil Separator with Many Applications. The Griscom-Russell Company has recently printed a leaflet describing the Bundy oil separator for removing oil from exhaust steam or removing any liquid entrained in gas or vapor.

An interesting feature of this separator is the special grid arrangement in staggered position on multiple plates. By this arrangement the liquid particles being carried along with the vapor are sure to be caught by the grids on the second plate if they pass between the grids of the first plate. After being caught by the grids, the particles of oil are immediately removed from the vapor path by dropping into an interior channel cut through the center of each column of grids so as to conduct the oil into the receiving chamber.

Copies may be obtained by writing to The Griscom-Russell Company, 285 Madison Avenue, New York City.

TRADE NOTES

At the annual meeting of the board of directors of **New York Shipbuilding Company** held in New York on April 18, the following officers were elected:

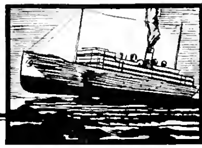
W. M. Flook, chairman of the board; C. L. Bardo, president; E. I. Cornbrooks, vice-president and general manager; J. F. Metten, vice-president; N. R. Parker, vice-president and treasurer; C. H. Dore, comptroller; J. A. Taylor, assistant comptroller; J. S. Ritchie, secretary and assistant treasurer; J. H. Irwin, assistant secretary and assistant treasurer; and H. Matlack, cashier.

The resignation of J. E. Slater as vice-president and treasurer was accepted by the board with many regrets. Mr. Slater leaves the service of New York Shipbuilding Company to accept a position with Coverdale and Colpitts, an outstanding firm of consulting engineers in New York.

The vacancies created by the resignation of Mr. Slater were filled by promotions as follows:

N. R. Parker, from comptroller to vice-president and treasurer; C. H. Dore, from assistant comptroller to comptroller; J. A. Taylor, from works accountant to assistant comptroller; J. S. Ritchie, from assistant secretary and assistant treasurer to secretary and assistant treasurer; J. H. Irwin, from cashier to assistant secretary and assistant treasurer; and H. Matlack, from assistant cashier to cashier.

E. P. Morse, president of **United Dry Docks, Inc.**, announces the appointment of D. Field Brittle, as his Assistant.



Marine Insurance

Edited by JAMES A. QUINBY

Shipyard Liability Construed

THE New York State courts have been busy for three years playing leap-frog with the extent of a liability insurer's liability, their latest guess upon the subject appearing in Atlantic Basin Iron Works vs. American Insurance Company, (The Monterey-Dixie), 1929 A.M.C. 336.

The iron works was repairing the steamer Monterey. The lighter Dixie was damaged by fire originating through the carelessness of workmen employed in repairing the Monterey. The iron works was insured against certain legal liability, which, it was contended, included liability for damage occurring as above. The underwriter, strange to say, had a different impression.

The coverage was issued on the ordinary marine form of policy and was stated as follows:

"$150,000. To cover the legal liability of the assured from any cause whatsoever for loss and/or damage and/or expense, if any, to vessels and/or craft and/or their cargoes and/or their freight (which may be in their hands for or on which they may be engaged or preparing to engage in work or operations), arising from or in connection with the operation of their plant situated at (Brooklyn), New York City, including work on or in connection with vessels anywhere in New York Harbor and/or adjacent inland waters of New Jersey, Hudson and/or East Rivers whether on dry docks and/or marine railways operated by others or otherwise, but excluding any liability hereunder for loss or damage for which the owner or owners of such other dry docks and/or marine railways may be liable. . . . .

"This insurance is also extended to cover, subject to the terms of the Builders' Risks Clauses as attached, the interest of the assured in work on such vessels completed or in process of completion."

Court Distinguishes Third Party Liability

The trial court (which for some inscrutable reason is known as the Supreme Court) held that such a policy did not cover liability to third parties for damage so arising, the court pointed out that "the legal liability of the assured which is covered by the policy is specifically limited to loss or damage to vessels which may be in the hands of the plaintiff or on which it may be engaged in work." (1927 A.M.C. 319)

In the Appellate Division (1928 A.M.C. 1690) the original holding was reversed, the court finding that the policy as a whole evidenced an intent to cover liability of any nature, so long as it was remotely connected with repairing vessels.

The Court of Appeals has now reversed the second finding and reinstated the first. In other words, the insurer is finally freed from liability.

In the course of the last opinion, we find the following comment:

"The Court below was of the opinion that the liability of the insurance companies could be predicated upon the printed form reading:

" 'It is further agreed that if the Assured shall **by reason of his interest in the insured ship** become liable to pay and shall pay any sum or sums in respect of any responsibility, claim, demand, damages, and/or expenses arising from or occasioned by any of the following matters or things during the currency of this policy, that is to say:

" 'Loss or damage to any other ship . . . . caused **proximately or otherwise by the ship insured . . .**

" 'Loss of or damage to any goods, ... whether on board the said steamship or not, which may arise from any cause whatever . . . .

" 'These assurers will pay the assured such proportion of such sum or sums so paid, or, which may be required to indemnify the assured for such loss as their respective subscriptions bear to the completed contract price of the ship hereby insured.'

"These clauses refer in our judgment to some proprietary interest of the assured in the ship out of which a liability has arisen for loss and damage occasioned by the ship. The fact that the Atlantic Basin Iron Works was interested in the ship to the extent of the work and material put in it did not make it liable in admiralty or at common law for the damage done to the lighter. Its liability was due to the negligence of its servants in doing the repair work on the ship; for this negligence neither the ship nor any one having an interest in the ship would be liable. Soderberg vs. Lighterage Corp. (2CCA), 1927 A.M.C. 907, 19 Fed. (2d) 286; Cromwell, 259 Fed. 166; Satilla, 221 Fed. 949."

From a cursory examination of the various decisions, the assured's position appears to our untutored mind to have a good deal to recommend it. If a man is insured

against "damage to any other ship . . . caused proximately or otherwise by the ship insured," and fails to recover on the facts of this case, simply because the workmen and not the ship did the damage, we can forgive him for going Bolsheviki. From the viewpoint of the insurance profession, the case is another example of the evil effects of adapting marine policies to fit any and all conditions.

Submarine Cable Up Again

WE have become used to hairline decisions giving a definite and final answer (one way or the other or both) to the vital question "Is a man on a boat when he is on a gang-plank?" We have also been enlightened upon "When is a stockholder an owner?" and "When is a warehouse not a warehouse?"

Now comes another case upon the questionable admiralty status of a submarine cable. (See The D. E. Callender, 1929 A.M.C. 187). This time the cable did not stay under the surface, but its owners had buoyed it on the surface in order to repair it. The Callender flirted her tail playfully at the cable and got all tangled up, damaging her propeller and the cable.

The shipowners filed a libel for their damage in the Federal District Court, and the cable company claimed the right to cross-libel. This right of cross libel was allowed, and both parties held at fault.

In sustaining the admiralty jurisdiction over the cross-libel, the court examines the case of Nippon Yusen Kaisha vs. Great Western Power Co., 17 F (2d) 239, where the cable was resting on the bottom, and distinguishes it as follows:

"Having in mind that at the time of the accident in question, the portion of the cable involved was afloat in navigable waters and that it was so afloat in the progress of a lawful operation to repair the cable, it is clear that the wrong involved in this case was committed wholly on navigable waters and the substance and consummation of the wrong took place upon those waters so that whatever cause of action exists in the respondent by reason of the damage to its cable became complete within the locality upon which admiralty jurisdiction depended within the rule of Plymouth, 70 U.S. 20, and Cleveland Ry. Co. vs. Cleveland Steamship Co., 208 U.S. 316. At the time of the accident in question this cable was in fact being navigated, in a limited sense, upon navigable waters and temporarily at least was a part of navigation. In this respect the case is clearly distinguishable from the Nippon Case (supra), and after due consideration it is concluded that admiralty has jurisdiction of the cross-libel."

Time to Sue Clause in Marine Policy Held Valid

WE have with us again the woeful figure of the assured who holds a certificate of insurance and is bound by the terms of a master policy which he never saw. In The Suruga, 1929 A.M.C. 360, the shipowner procured from the Automobile Insurance Company a certificate of insurance covering collectible freight on a voyage from Spain to Philadelphia. By reason of stranding and jettison, which were perils insured against, the freight was lost. After the usual series of bickering negotiations, the assured brought suit to recover. The company, in defense, produced a policy No. 100,000, referred to in the certificate, but retained by the insurer. The policy contained the following clause:

"No suit or action against this company for the recovery of any claim by virtue of this policy shall be sustained in any Court of law or equity unless commenced within one year from the time loss occurred."

The certificate which had been issued to the shipowner bore no such provision. The suit, of course, was begun more than a year after the loss.

The District Court in New York held the action barred, on the ground that the certificate was not a complete contract in itself, and bound its holder by reference to Policy No. 100,000. In support of this finding, the court comments as follows:

"Under these circumstances, I believe the Policy No. 100,000 was a part of the contract between the parties and that every clause in it must be given effect, including the time limitation. Even if the principal case relied upon by plaintiff—DeMonchy et al. vs. Phoenix Ins. Co., 44 Law Times Rep. 364—should be in accordance with the law of this jurisdiction, it is clearly distinguishable from the case at bar because the certificate there contained the complete statement of the risk which resulted in the loss sued for. Moreover, one of the opinions states:

" 'I express no opinion as to what the position would be if the claim had been in respect of a risk not covered by the certificate but covered by the provisions of the policy; where of necessity the policy must be referred to and read in conjunction with the certificate.' "

While such a result is probably unfair to the holder of the certificate, it is no more so than the doctrine supported by a line of well-known cases holding that a carrier may by reference incorporate in a given bill of lading any number of defenses in another document,

and thus bind a shipper by the terms of a contract which the latter has never seen.

Apparently, the only safe thing for an assured or cargo owner to do is to read the paper he gets, and as he never has time to do that, lawyers continue to function.

Crossed Examination

The art of cross-examination sometimes leads to startling testimony, but it more often leads to an anti-climax.

We have in mind a recent occasion when a Norwegian quartermaster was being heckled by a battery of legal talent in the hope that he would divulge the compass bearing of his vessel at the exact moment of a collision. The cross-examination ran something like this:

Q. Now, Mr. Olson, what course were you steering five minutes before the collision?

A. North by 32 West.

Q. How do you know?

A. Ay looked at the compass.

Q. And did you look at the compass just before the collision?

A. Yes.

Q. And what course were you steering then?

A. North by 32 West.

Q. And now, Mr. Olson, did you look at the compass immediately after the collision?

A. Yes.

Q. How was your vessel heading at that time?

A. Ay don't know.

Q. What? I thought you said you looked at the compass after the collision.

A. Yes.

Q. And yet you don't know how your ship was heading?

A. No.

Q. Why not?

A. The lights went out.

Which reminds us of a witness who was being examined in a salvage case. He had apparently told his attorney about a conversation which took place between his master and the insurance company's surveyor. On direct examination the attorney accordingly started in on it as follows:

Q. Now what did the master of your vessel say to the insurance man about the inadequacy of the pumps?

A. Well—

Opposing attorney, interrupting: We object on the ground that this is clearly hearsay and is not binding in any way or manner upon us. Furthermore no proper foundation has been laid for such question and no showing made that it was of any relevancy. We object on the ground that it is incompetent, irrelevant, and immaterial to the point at issue.

First attorney: Never mind all that, you may answer. What did the master say to to insurance man?

A. I didn't hear the master say anything."

Standard and Western Change Hands

The recent merger of J. B. F. Davis & Son with Marsh & McLennan at San Francisco has resulted in a change of agency for the Standard Marine and Western Assurance Companies, formerly controlled by J. B. F. Davis & Son.

The Pacific Coast management of the Standard Marine has been taken over by the firm of Geo. E. Billings Co. with offices at 312 California Street. The present staff of Geo. E. Billings Co., one of the oldest and best known firms in San Francisco, will be augmented by the addition of Harry Pinkham, who will function as marine agency manager, a position which he formerly held in the Davis organization.

E. C. Evans & Sons, well-known steamship and insurance agents of San Francisco, have taken over the Pacific Coast management of the Western Assurance Company and will guide its destinies from their office at 260 California Street. W. J. Jansen, formerly of the staff of J. B. F. Davis & Son, is associated with the new agency as marine manager.

E. C. Evans & Sons have been established in San Francisco since 1880 and have for some years been general agents for the Indemnity Mutual Insurance Company and agents for the United Kingdom Service of the Isthmian Lines.

Study Class Ends Term

The Study Class of the Association of Marine Underwriters of San Francisco at its fourteenth meeting of the year, held on April 15, was favored by an outline of the "Present Status of the Longshoremen's and Harbor Workers' Compensation Act," delivered by Warren H. Pillsbury, deputy commissioner for the Federal Employees Compensation Commission. Mr. Pillsbury, who was formerly attorney for the California Compensation Commission, displayed an intimate familiarity with the question of conflicting jurisdiction arising in connec-

(Continued on Page 257)

tion with injuries to stevedores. He discussed the history of the federal act and its borderline of influence as compared to the state compensation acts and the rights of seamen under the Jones Act at admiralty law, and expressed the opinion that federal compensation legislation will necessarily be extended to include seamen.

The second speaker of the evening was Donald A. McPherson, assistant to operating manager of the American-Hawaiian Steamship Company, who discussed "Port Conditions in the Orient." Mr. McPherson, who has just returned from a survey of Oriental ports made for the purpose of establishing a new service by his company, painted a glowing picture of conditions in Yokohama, Kobe, Shanghai, Dairen, and Manila, laying stress upon the improved dock and warehouse facilities at these ports. His impression of other ports in the Orient was not favorable due to the prevalent custom of discharging into lighters. His description of conditions at Tientsin, where cargoes are lightered up the river from Taku Bar, was particularly unfavorable.

The fifteenth and final meeting of the eighth term of the Study Class of the Board of Marine Underwriters was held on the evening of April 29. The meeting was marked by a large and enthusiastic attendance to hear Ernest E. Williams, Deputy United States Attorney, and William B. Acton of the San Francisco Admiralty Bar.

Mr. Acton spoke on "Bill of Lading Defenses," laying particular stress upon time clauses in contracts of affreightment. He pointed out that cargo underwriters could reduce their losses materially by careful attention to their rights of subrogation against the carriers, and the protection of these rights depended upon observance of the various time limitations laid down in the bills of lading.

Mr. Williams, who has recently been appointed United States Commissioner, had for his subject "Maritime Angles of Prohibition Enforcement," a topic upon which he was well fitted to speak by reason of his experience in abatement cases for the government. He gave a concise outline of the law and practice in prohibition cases both from the viewpoint of federal and state officials and expressed the opinion that more rigid enforcement would only be secured by increasing the powers and number of federal agents.

When a Rock Strikes a Ship, That's News

Among our collection of peculiar cases we must list the Dredge No. 7, 1929 A.M.C. 372, which involved damage caused by a large stone which lodged in an elbow of the discharge line. The elbow was fractured, and water entered and sank the vessel.

The owner contended that the sinking resulted from a peril of the sea, and asserted a right of recovery under a policy bearing no Inchmaree, Accidents in loading, or Ejusdem Generis clause, but outlining its coverage by the following provisions:

"It is the intent of this Insurance Company by this policy, to Fully Indemnify the Assured for this Company's proportion of all General Average charges, Salvage expenses and loss, damage, detriment or hurt to said vessel for which they may be liable under this Policy, against the adventures and perils of the Harbors, Bays, Sounds, Seas, Rivers, and other waters as above named, and Fires that shall come to the hurt, detriment, or damage of said vessel or any part thereof. Excepting always, all claims arising from or caused by the following, or other legally excepted causes, viz., . . . from the bursting or explosion of boilers, collapsing of flues or any injury, derangement or breakage of machinery unless caused by stress of weather, stranding, collision or burning."

After discussing numerous English and American cases holding that unintentional entrance of sea-water may constitute a peril of the sea, the court (Hazel, D. J., Western District of New York) comes to the conclusion that the elbow in question is really a part of the hull of the vessel, rather than machinery, and consequently does not come within the machinery exception.

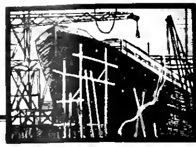
"The stone," says the court, "entering the pipe extension from the creek and thence passing to the elbow, comes closed in comparison to a ship striking a rock and puncturing her bottom, which, I take it, would be a loss due to a peril of the sea."

Record Repair Job

ONE of the most expeditious ship repair jobs ever handled at the port of New York was the overhauling of the big United States liner George Washington, which was completed recently at the Tietjen & Lang plant of the Todd Shipyards Corporation, practically a full day under the time limit fixed in the contract with the Shipping Board.

The work, which was started on March 13th, included the most extensive boiler repairs and remetalling of engine bearings ever done in this port. Sixteen new furnaces were installed in five of the vessel's battery of twelve boilers.

This work was completed April 18 and after a dock trial on that day the ship was turned over to her new owners, the United States Lines, Incorporated, ready to start for Europe on her scheduled date, April 24.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Some Shipbuilding Work in Prospect

New Bids Asked for Fisheries Ship

The U. S. Bureau of Fisheries at Seattle, Washington, has rejected all bids submitted for the construction of a patrol boat for the Pribilof Islands service as being too high, and new bids will be opened June 15.

The vessel is to be built of Douglas fir and Alaska yellow cedar, strong enough to withstand the hard service of Bering Sea Patrol for the protection of the seal herds at Pribilof Islands. Specifications call for length of 130 feet, beam 27 feet, depth 17 feet 10 inches. Accommodations are to be provided for 32 white men and 24 natives, and cargo capacity of 150 tons.

Propulsion power will be furnished by a 400-horsepower 6-cylinder, directly reversible, Union diesel engine. Plans and specifications were prepared by H. C. Hanson, naval architect of Seattle.

Passenger Vessel for Alaska

Award of contract for the construction of a 420-foot passenger and freight vessel by the Alaska Steamship Company of Seattle is expected shortly. Bids have been submitted for the construction and equipment of a vessel for the Puget Sound-Alaska service which call for turbo-electric propulsion, specified at 8000 horsepower, and accommodations for a goodly number of passengers.

Bids for Cruiser to be Opened This Month

Secretary of the Navy, Charles P. Adams, opens bids on June 5 for the construction of the first two of the 10,000-ton cruisers to be built in private shipyards for the United States Navy and estimates for three 10,000-ton cruisers to be built in government navy yards.

New Vessels for Canadian West Coast

The Canadian Parliament has approved the appropriation for the construction of additional tonnage for the Canadian National Steamships for operation on the West Coast of British Columbia and Alaska. Bids have been asked for the construction of three vessels for operation from Vancouver and Prince Rupert to Alaska and one to operate from Prince Rupert to Queen Charlotte Islands, the total cost to be around $5,000,000.

Matson Order Awaits Confirmation

While the Fore River Plant of the Bethlehem Shipbuilding Corporation was low bidder for the construction of two de luxe passenger and freight liners for the Matson Navigation Company for its San Francisco-Australia service, approval of the plans and award of contract by the Shipping Board has not yet been made. A. C. Diericx, vice-president and general manager of the company, has been in Washington for some time, and the approval of the three agencies of the government -- the Shipping Board, the Post Office Department, and the Navy Department—are expected shortly.

Ask Vessel for Flood Relief On Mississippi

Construction of a shallow draft vessel to be used for flood relief purposes or for training the Naval Reserve has been introduced into the House of Representatives. The proposed vessel would cost $350,000 and would be stationed at St. Louis.

Shipping Board Plans New Dieselization Program

Following the rejection of the offers of two Pacific Coast steamship lines to start a Pacific Coast-European Service with the recently converted freighters as a basis, the Shipping Board has decided to convert a fleet of eight freighters to diesel drive and offer them for sale for the West Coast-European trade to an American company.

There are many rumors to the effect that the Luckenbach interests are desirous of inaugurating a Pacific Coast-Europe service in combination with their intercoastal service. Edgar Luckenbach is reported to be in London conferring on the possibilities of the successful operation of such service.

The eight ships which the Shipping Board has in mind for conversion are of the "Statesman" type of 12,000 tons, now powered with 8000-horsepower steam turbines. In converting the vessels, the plans would be to equip the vessels with diesel engines, a certain amount of refrigerator space for the carriage of California perishable fruits, and accommodations for 60 persons.

New Ferryboat for New York

The New York City Department of Plant and Structure is planning the construction of a 151-foot ferryboat to have diesel-electric drive.

New Passenger-Cargo Vessel for Grace Line

According to reports from the Atlantic Coast, W. R. Grace & Co., of New York, is planning the construction of another turbo-electric passenger and freight vessel for its New York-South America service. This company now has a vessel, the Santa Clara, under construction at the plant of the New York Shipbuilding Co. The Santa Clara is 482 ft. 9 in. long and will have General-Electric turbo-electric propulsion plant.

School Ship for California

Both houses of the California Legislature have approved a bill creating a nautical school ship for California to be operated as a branch of the State Board of Education. It is now awaiting the approval of the Governor.

The bill provides for an appropriation of $115,000 for the equipment of a vessel to be supplied by the United States Shipping Board. Complete plans and description of the type of vessel proposed for this purpose will be published in the July issue of this magazine. The Navy Department will provide $25,000 a year for the operation of the school ship in addition to supplying instruction staff.

Shallow Draft Tanker

The Shell Union Oil Corporation of St. Louis will probably build a shallow draft tank barge for river service.

New Fireboat for New York

Plans for a gasoline driven, twin-screw, all steel fireboat for the City of New York are being prepared by Henry J. Gielow, Inc., naval architect, and Fire Commissioner J. J. Dorman has advertised for bids. The boat will be 130 ft. long, 26 ft. beam, 7 ft. 6 in. draft. She will have five 548-horsepower engines developing a total of 2740 horsepower, each of which will be connected to electric generator. Two propulsion motors will have 1165 horsepower each. Total power is available for pumping motors on arrival at fire. The boat will be completely equipped with high pressure fire pumps, ventilation system, and carbon dioxide fire fighting equipment.

Third Liner Planned for Ward Line

Theodore E. Ferris, naval architect at 30 Church Street, New York, has completed plans and specifications for a third passenger and freight vessel for the New York-West Indies trade of the Atlantic, Gulf & West Indies Steamship Company of New York, according to an announcement made by F. D. Mooney, president. The vessel will have turbo-electric drive and will be similar to the two vessels for which contract was recently placed with Newport News Shipbuilding & Drydock Co.

Combination Fish and Tug Boat

A group of east and west coast business men are interested in plans for a combination workboat which will be used in the tuna fishing business out of San Pedro, but which will be equipped for towing service or for sardine fishing as the season warrants. She will be 85 feet long and cost about $60,000. Chas. I. Houghton, San Pedro, ship broker, will direct the work of construction.

Some Recent Shipbuilding Contracts

New York Shipbuilding Company, Camden, New Jersey, has been awarded contract by the Export Steamship Corporation of New York for four passenger and freight vessels for the Mediterranean service of this company.

The vessels will be 450 feet long between perpendiculars, 61 feet 6 inches breadth, 33 feet 3 inches molded depth. They will have steam turbines developing 6300 shaft horsepower geared to a single propeller. Steam will be supplied by four oil-fired water-tube boilers at 325 pounds per square inch working pressure and 150 degrees superheat. The vessels will each be of 8200 tons deadweight, will have accommodations for 100 passengers, in first cabin, and will have an average speed of 14 knots.

When bids for these vessels were opened last November, The Spear Engineers, Inc., were low bidders; but all bids were rejected and contract was awarded to the New York Shipbuilding Company on special agreed price said to be between $8,000,000 and $9,000,000 for the four.

Newport News Shipbuilding & Drydock Co., is reported to have received contract from the Dollar Steamship Company, San Francisco, for two de luxe passenger and freight vessels for the transpacific service.

Stanley Dollar, vice-president and general manager of the company, is now in Washington, seeking the approval of the Shipping Board for the award of contracts under the construction loan fund.

The plans and specifications were prepared under the supervision of Carl E. Petersen of the Newport News yard and call for a length over all of 653 ft.; length between perpendiculars of 615 ft.; beam, 81 ft. depth molded to shelter deck 52 ft., loaded draft 32 feet. They will have capacity for 332 first class, 140 tourist, and 772 steerage passengers.

United Dry Docks, Inc. (Staten Island Shipbuilding Co.), Mariner's Harbor, New York, has an order from Atlantic, Gulf & Pacific Co. for a 162 ft. dredge hull; order from City of New York, Dept. of Docks for a 56-ft. pile driver hull; and from the Standard Transportation Co. for two steam tugs, 91 ft. 6 in. long.

American Bridge Company, Pittsburgh, has an order from J. K. Drumm & Bros. for 6 sand barges, 135x27x7 ft.; also from Inland Waterways Corp. for 24 cargo barges, 230x45x11 ft. to cost $61,000 each.

Great Lakes Engineering Works, River Rouge, Mich., has an order from Dunbar & Sullivan Dredging Co. for a steel dump scow, 160x40 ft.

Midland Barge Co., Midland, Pa., has an order for five steel cargo barges for the Inland Waterways Corp., 230x45x11 ft. to cost $61,000 each.

Charles Ward Engineering Works, Charleston, West Va., has an order for a steel tug for U. S. Engineers Office, Philadephia, 65 ft. 6 in.; also order for yacht for Harold M. Ward of Charleston 50x12x4 ft.

Bath Iron Works, Bath, Maine, has an order for a steel yacht, to be named Malaina, designed by B. T. Dobson. The yacht will be 168 by 26 by 9 feet, powered with twin Winton diesel engines developing 1600 horsepower.

This yard also has a repeat order from the Atlantic & Pacific Fish Co. of Boston for two more diesel trawlers to be 116 by 23 by 11 feet, each powered with a 500 horsepower Bessemer diesel engine.

Order for a steel, auxiliary schooner yacht from the well known New York yacht designer Henry J. Gielow, Inc., has been received by this yard. The yacht will be 150 by 32 feet, single screw, with 300 horsepower Bessemer diesel engine.

Charleston Dry Dock & Machinery Co., Charleston, S.C., will build an all-welded tanker for stock.

Howard Shipyards & Dock Co., Jeffersonville, Ind., has entered order for a steel towboat 148 x 30 x 5 feet.

Sun Shipbuilding Company, Chester, Pa., has an order from the Tide Water Oil Co. for a steel oil barge to be 188 ft. 6 in. by 31 ft. by 11 ft. 6 in.; capacity 6000 barrels of oil on 9 ft. draft.

REPAIRS

Bethlehem Shipbuilding Corp., Union Plant, San Pedro Works, was recently awarded contract for repairs to the Westfal-Larsen steamer Evanger, which went ashore at Huntington Beach, near San Pedro, cost of work to be approximately $93,980 and 40 days. The ship has a broken stern frame, rudder, and propeller, and damage to almost her entire bottom. Other bids were: General Engineering & Drydock Co. $99,250, 45 days; Moore Dry Dock Co. $97,812, 45 days; Los Angeles Shipbuilding & D.D. $98,072, 45 days.

General Engineering & Drydock Co., Oakland, Calif., was recently awarded extensive bottom damage repairs to the Alaska Packers' steamer Chirikof, which struck a reef off the coast of Alaska. Bids on this job were:

General Engineering & Drydock Co., $98,500 and 40 days; Bethlehem, $106,482, 42 days; Moore Dry Dock, $107,118, 43 days.

Only temporary repairs are being made this time. The general repairs are to be made at the close of the salmon season.

Todd Dry Docks, Inc., Seattle, was recently awarded two important repair contracts. One is for extensive bottom damage repairs to the freighter Maltram, which went ashore at Marrowstone Point. Cost will be about $50,000.

This yard will repair the Matson freighter Mauna Ala which was damaged when she collided with the British steamer Errington Court April 24. Todd was low bid for the work at $23,000.

Yarrows, Ltd., Victoria, B.C., was low bidder for repairs to the steamer Errington Court at a price of $25,000.

U. S. Army Engineers' dredge A. MacKenzie will be repaired by the Navy Yard at Mare Island, California, this yard having submitted low estimate of $33,641.40 for repairing the dredge ladder, hull, and machinery. Other bidders for the work were: Moore Dry Dock Co., $45,140; Bethlehem, $46,968; and General Engineering & Drydock Co., $49,274.

Craig Shipbuilding Company, Long Beach, Calif., has just completed the conversion of the steam yacht Peary (owned by M. F. Bramley) from coal to oil-burning at a cost of $12,000. Mr. Bramley is said to be a Cleveland millionaire and will use the Peary in exploring for a "dream island" off the Mexican Coast.

Todd Dry Docks, Inc., Seattle, has just completed extensive alterations to the Steamship Queen of the Pacific Steamship Company to fit her for the Puget Sound-Alaska trade. All passenger accommodations on Decks A and B were rebuilt, the social hall was redecorated and refurnished, and a new electric lighting system installed, in addition to a general overhaul.

Marine Exhibit to be Held in Seattle

The Seattle Chamber of Commerce is sponsoring a Pacific Northwest Merchants and Maritime Exposition to be held at the Civic Auditorium from July 29 to August 3. Harry W. Kent of the Chamber of Commerce is general chairman. Captain C. J. Stewart is president of the Maritime Association.

The following committee has been appointed to handle the marine section: Captain J. Howard Payne, chairman; Raymond F. Farwell, William Clausen, John Cormode, George Cary, Otto H. Eisenbeis, and Harrison Hart.

The Puget Sound Tug & Barge Co. of Seattle, Washington, has started operations as the holding and operating company for the Cary-Davis Tug & Barge Company, the Drummond Lighterage Company, and the Pacific Tow Boat Company. The three concerns will operate as one unit a combined fleet of 27 tugs and 48 barges. Geo. W. Johnson is president; Geo R. Cary, vice-president; A. L. McNealy, treasurer; H. J. Hart, secretary; Captain Lindley Davis is the operating manager in Seattle; and L. E. Moe is operating manager at Everett.

Newport News Appointment

Carl E. Petersen has been appointed assistant to vice-president of the Newport News Shipbuilding and Dry Dock Company with offices at 233 Broadway, New York City.

Reconstruction work has started at the Portland, Oregon, plant of the Albina Marine Iron Works to repair the damage caused by fire on April 18, estimated at $100,000. The machine shops were destroyed. The machine shops of the Albina Engine & Machine Works will be merged with the parent concern and the force working on the three lightships are using the facilities of the former until the completion of the new building.

The Shipping Board will advertise for bids for the sale of the Yankee Line and the American Gulf Orient Line to American citizens for guaranteed operation in the present services of the lines. The Yankee Line is operated by Rogers and Webb of Boston out of Boston and other Atlantic Coast ports to Hamburg and Bremen. The American Gulf Orient Line is operated by the Tampa Inter-Ocean Steamship Company of New Orleans out of Gulf ports to Far Eastern ports.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of May 1, 1929

Pacific Coast

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133′3″ length over-all; 30′ beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28 est.

Hull No. 113, lightship, sister to above; keel Sept. 1/28 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BETHLEHEM SHIPBUILDING CORPORATION, LTD,. UNION PLANT
Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Hualalai, hull 5336, passenger and freight steamer for Inter-Island Steam Navigation Co., Honolulu; 295 L.B.P.; 27′6″ beam; 17′6″ loaded draft; 15 knots speed; 1200 D.W.T.; steam turbines; 4000 S.H.P.; 4 W.T. boilers, keel Dec. 17/28; launched Mar. 23/29; deliver June 1/29 est.

Humuula, hull 5338, steel passenger and freight steamer for Inter-Island Steam Navigation Company, Honolulu, 1100 Gr. tons; keel Apr. 1/29; launch June 10/29 est

Eleu, hull 5339, twin screw diesel tug for Inter-Island Steam Navigation Co., Honolulu; 117 L.O.A.; 28 breadth, 16 depth; keel Jan. 28/29; launched Mar. 21/29.

Hull 5340, barge for Inter-Island Steam Nav. Co., Honolulu; launched Mar. 21/29; deliver May 15/29 est.

Not named, hull 5342, steel tow barge for Shell Co., Los Angeles; 131 L.O.A.; 40 beam; 9′6″ draft; 1000 gr. tons.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A. Wanner.

Hull 19, tow barge for Standard Oil Co. (Calif.), San Francisco; 72 L.B.P.; 24′ beam; 4′ loaded draft; 100 D.W.T.

Not named, hull 20, fishing boat for A. Paladini, Inc., San Francisco; 65′ L.O.A.; 16 beam; 6 loaded draft; 125 H.P. 5-cyl. Union diesel eng.; keel Oct. 19/28.

J. C. JOHNSON'S SHIPYARD
Port Blakley, Wash.

One K-D. scow for Northwestern Fisheries Co., Seattle; 65 x 22 ft.

LAKE WASHINGTON SHIPYARDS,
Houghton, Wn.

Purchasing Agent: A. R. Van Sant.

Foshay, hull 107, steel passenger and freight motorship for Northland Transportation Co., Seattle; 186x35 ft. beam; two 550-H.P. Washington-Estep diesel engs.; keel Mar. 4/29.

THE MOORE DRY DOCK CO.
Oakland, California.

Purchasing Agent: N. Levy.

Coronado, one steel, screw double-ended diesel-electric automobile ferryboat for San Diego and Coronado Ferry Co.; 190 L.O.A.; 43′6″ breadth of hull at deck; 60′

breadth over guards; 14'9" depth at sides, molded; 8'11" light draft, molded; keel Dec. 27/28; launched Mar. 7/29; delivered Apr. 15/29.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

Purchasing Agent: C. C. Labric.

Not named, hull 28, fish packer for Canadian Fish & Cold Storage Co., Prince Rupert, B.C.; 67 L.O.A.; 16'6" beam; 8'8" depth; 50 D.W.T.; 60 B.H.P. Fairbanks-Morse C.O. eng.; keel Mar. 15/29; launch May 23/29 est.

Ispaco I, hull 29, pilchard seine boat for Island Packing Co., Victoria, B.C.; 65 L.O.A.; 17'5" beam; 7'8" depth; 75-H.P. Atlas-Imperial diesel eng.; keel Mar. 15/29.

Ispaco II, hull 30, sister to above; keel Mar. 15/29; launch May 23/29 est.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty decked barges for U.S. Engineers, Rock Island; 108 x 24 x 5 ft.

Six barges for Erector Dept.; 175 x 26 x 11 ft.

Six sand barges for J. K. Drum & Bros.; 135 x 22 x 7 ft.

Twenty-four cargo barges for Inland Waterways Corp.; 230x45x11 ft.

AMERICAN SHIP BUILDING CO.,
Lorain, Ohio

Purchasing Agent: C. H. Hirsching.

Not named, hull 804, bulk cargo vessel for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12½ mi. speed; T.E. eng. 2200 I.H.P.; 3 Scotch boilers, 14 x 12 ft.; keel Mar. 25/29; launch June 8/29 est.; deliver July 29/29 est.

Not named, hull 805, sister to above; keel Apr. 8/29; launch May 18/29 est.; deliver June 22/29 est.

BATH IRON WORKS
Bath, Maine

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer; keel Dec. 3/28; launch Apr. 10/29 est.; deliver May 1/29 est.

Hi-Es-Maro, hull 123, twin screw steel diesel yacht, Henry J. Gielow, Inc., New York, designer; 266'x35'x22' depth; 14'6" draft; two 1200 B.H.P. Bessemer diesel engs.; keel Nov. 14/28; launch May 8/29 est; deliver July 15/29 est.

Corsair, hull 124, twin screw steel steam turbo-electric yacht; 343x42x27ft., 18 ft. draft; 6000 S.H.P.; General Electric turbo-generators; Babcock & Wilcox boilers; keel June 10/29 est.

Ebb, hull 126, fishing trawler for Bay State Fishing Co., Boston, Mass., Bath Iron Works design; 132'4" L.O.A.; 121'6" L.W.L.; 24 beam; 13 depth; 500-600 B.H.P. Winton diesel engs.

Flow, hull 127, sister to above.

Malaina, hull 128, steel yacht; B. T. Dobson, designer; owner not named; 168 L.B.P.; 26 beam; 9 draft; twin Winton diesel engs.; 1600 I.H.P.

Notre Dame, hull 129, trawler for A. & P. Fish Co., Boston; 116 I.H.P.; 23 beam; 11 loaded draft; single screw; 500 I.H.P. Bessemer diesel eng.

Fordham, hull 130, trawler; sister to above.

Unnamed, hull 131, steel aux. schr. yacht; Henry J. Gielow, designer; owner not named; 150 L.B.P.; 32 beam; single screw; 300 I.H.P. Bessemer diesel eng.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Not named, Hull 1422, single-screw coal collier for Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Not named, hull H-1424, steel passenger and freight steamer for New England Steamship Co., 1800 gro. tons.

Hull 1425, steel coasting vessel for Seaboard Shipping Co.; 450 gr. tons.

BETHLEHEM SHIPBUILDING CORP., LTD.,
Baltimore, Md.

Hull 4240, steel 3-track carfloat for Western Maryland Railway; 325 x 38'6" x 10'8".

Hull 4241, same as above.

Hull 4242, same as above.

Hull 4243, steel barge for Western Maryland Rly. Co

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; Winton engs.; General Electric generators and motors; keel Jan. 30/29 ; launch July 1/29 est.

No. 116, same as above; keel Feb. 6/29; launch Sept. 1/29 est.

No. 117, same as above; keel May 1/29; launch Dec. 1/29 est.

One all-welded tanker for stock.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2921, 106-ft. cruiser for L. M. Wainwright, Indianapolis; 2 Speedway diesels, 300 H.P. ea. at 700 r.p.m., wt. 7500 lbs.; deliver May/29 est.

Hull 2923, 66-ft. cruiser for J. McMillan, Detroit, Mich.; 2 170-H.P. Speedway engs.; deliver May /29 est.

Not named, hull 2925, 64-ft. cruiser for Rear Admiral L. M. Josepthals, New York; 2 170-H.P. Speedway engs.; deliver May/29 est.

Not named, hull 2927, 35-ft. fishing boat for Leon Goodman, Philadelphia; two 44-H.P. Speedway engs.; deliver June 1/29 est.

Not named, hull 2930, 106-ft. cruiser for W. C. Robinson, Pittsburgh; 2 Speedway diesel engs.; deliver May 15/29 est.

Hull 2931, 16-ft. yacht tender for above; 1 Universal eng.

Not named, hull 2932, 50-ft. fishing boat for Caleb S. Bragg, New York; 2 170-H.P. Speedway engs.

Not named, hull 2935, 35-ft., runabout for R. H. Gallatin; 170 H.P. Speedway eng.; deliver May 1/29 est.

Not named, hull 2936, 75ft. commuter boat for B. H. Borden; 2 300-H.P. Speedway engs.; deliver June 1/29 est.

Not named, hull 3937, 66ft. day cruiser for G. B. Hoppin; 2 170-H.P. Speedway engs.; deliver July 1/29 est.

Not named, hull 2938: 66ft. day cruiser for H. Murray; 2 170 H.P. Speedway engs.; deliver Aug. 1/29 est.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Yoreda, hull 131, steel yacht, for Aaron De Roy, Detroit; 105 L.B.P.; 17 beam; 6 loaded draft; 14 mil. loaded speed; 110 D.W.T.; 250 H.P. diesel eng.; keel Aug. 1/28; launch May 15/29 est.; deliver June 1/29 est.

Bonny II., hull 132, wood yacht for C. W. Bonbright, Flint, Mich.; 61 L.B.P.; 13 beam; 4 loaded draft; 18 m.p.h.; 300 I.H.P. gas eng.; keel Oct. 15/28; launched Apr. 15/29; delivered May 1/29.

Olive K., hull 133, steel yacht for C. F. Kettering, Detroit; 169 L.B.P.; 26 beam; 12 loaded draft; 15 knots speed; 600 D.W.T.; 1000 I.H.P. diesel engs.; keel Jan. 15/29; launch July 1/29 est.; deliver Aug. 15/29 est.

Verona J, hull 134, wood yacht for Albert A. Rose, Detroit; 75'6"' I.H.P.; 14'6" beam; 14' loaded draft; 18 M.P.H.; 70 D.W.T.; 500 H.P. gas eng.; keel Jan. 5/29; launch and deliver May 5/29 est.

Robark, hull 135, wood yacht for K. T. Keller, Detroit; 83 L.B P.; 15'6" beam; 4'6" loaded draft; 14 M.P.H. speed; 82 D.W.T.; 300 H.P. Winton diesel engs.; keel Feb. 15/29; launch June 1/29 est.; delivery July 1/29 est.

Not named, hull 136, steel yacht for A. V. Davis, New York; 138'6" L.B.P.; 18 beam; 5 loaded draft; 20 M.P.H.; 150 D.W.T.; 1400 I.H.P. diesel engs.; keel June 1/29 est.; launch Oct. 1/29 est ; deliver Apr. 15/30 est.

Not named, hull 137, steel yacht for M. H. Alworth, Duluth; 135 L.B.P.; 22 beam; 6'9" draft; 14 M.P.H.; 175 D.W.T.; 600 I.H.P. diesel engs.; keel Apr. 15/29 est.; launch Sept. 1/29 est.; deliver Nov. 1/29 est.

DRAVO CONTRACTING COMPANY,
Pittsburg, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'6" x 26'6" x 5' 6".

Talcott, hull 810, steel hull dredge for U.S. Engineers Office, Washington, D.C.; 620 gr. tons.

Hulls 811-815 inc.: five steel dump scows for American Dredging Co., Philadelphia; 112 x 34 x 12 ft.

Hull 816, steel oil barge for American Dredging Co., Philadelphia; 100 x 34 x 10'3".

Hull 817, one welded steel barge for stock; 100 x 26 x 6'6".

Hulls 821 to 825 inc.; 5 deck scows for New York Central R.R.; 100'x33'8"x9'7".

Hulls 826 to 829 incl.; 4 1500-cu. yd. dump scows for Geo. H. Breymann & Bros., New York.

Hull 832, steel oil barge for Atlantic, Gulf & Pac. Co., 100x30x 9 ft.

Hull 833, steel floating dry dock for Warner Co., Philadelphia.

Hulls 858 to 876 incl., 19 standard M.R.C. type steel barges for U.S. Engineers' Office, Memphis; 4 delivered.

Hulls 877 to 882 incl., 6 standard M.R.C.

type steel barges for U.S. Engineers' Office, Memphis.

Hulls 883-892 incl., 10 steel sand and gravel barges for Arundal Corp., Baltimore; 130 x 34 x 8'9".

Hulls 893 to 898 incl., six steel hopper type coal barges for Island Creek Coal Co., Huntington, W. Va.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 105, oil barge for Oil Tank Corp.; 146x34'8"x10'2¼" (welded barge); keel Nov. 1/28, launched Mar. 30/29; **delivered Apr. 6/29.**

Hull 109, dredge hull for Gahagan Const. Co., 160 x 40 x 13'6"; keel Mar. 13/29; launch June 1/29 est.

GREAT LAKES ENGINEERING WORKS,
River Rouge, Michigan

Myron C. Taylor, hull 269, bulk freighter for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12 mi. speed; 12,000 gr. tons; TE engs. 2250 I.H.P. 2 W.T. boilers; keel Mar. 14/29; launch July 6/29 est.; delivery Aug. 1/29 est.

Hull 271, steel dump scow for Dumbar & Sullivan Dredg. Co.; 168 x 40 ft.; keel 5/13/29 est.; deliver 7/1/29 est.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1660, lighthouse tender for U.S. Bureau of Lighthouses; 100x30x5'; keel Mar. 11/29; launch 5/16/29 est.; deliver 6/16/29 est.

Hull 1677, track barge for Yourtel-Roberts Sand Co., Chester, Ill.; 195x30x6'6".

Hulls 1673-1676, four combination cargo and oil barges for American Barge Line Co., Louisville, Ky.; 150x35x11'.

Houghland, hull 1672, steel hull for towboat for Walter G. Hougland, Bowling Green, Ky.; 86x22'x42"; **keel 4/2/29;** launch 5/10/29 est.

Hulls 1667-1671, five steel motorboats for U.S. Engineers, Vicksburg, Miss.; 30 x 7'6"x2'6".

Hull 1661, stock towboat; steel; 148x30x 5 ft.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 244, diesel-electric dipper dredge for Great Lakes Dredge & Dock Co., 156 L.B.P.; 43 beam; 10 ft. draft aft; keel Aug. 30/28; launched Dec. 18/28; deliver June 1/29 est.

City of Saginaw, hull 246, car ferry for Pere Marquette Rail; Co.; 368 L.B.P. 57 beam; 17 loaded draft; 18 m. speed; 2 turbines; 3600 I.H.P. each; 4 Babcock & Wilcox W.T. boilers; keel Mar. 4/29; launch July /29 est.

City of Flint, hull 247, car ferry, sister to above; **keel May 1/29.**

Reality, hull 248, steel yacht, owner not named; 78 long; 15 beam; 8'9" depth; 6' draft; 150 H.P. Fairbanks - Morse eng.; keel 6/1/29 est.

MIDLAND BARGE COMPANY
Midland, Pa.

Eight steel pontoons for U. S. Engineers, Louisville, Ky.; 40 x 18 x 2'6"; launch and deliver May 4/29 est.

Two steel barges for Wheeling Steel Corp., Wheeling, W. Va.; 100 x 26 x 8 ft.

One steel derrick hull for M. H. Treadwell Co., New York; 84 x 33 x 7'6".

Two steel barges (K.D.) for M. H. Treadwell, New York; 50 x 16 x 5'6".

Five steel cargo barges for Inland Waterways Corp.; 230x45x11 ft.

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Fernie, hull 23, single screw package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42'9" beam; 14' loaded draft; 12 mi. speed; 2200 D.W.T.; TE steam engs.; 1300 I.H.P.; 2 Scotch boilers, 14'6" dia. x 11' long; keel Dec. 4/28; launched Feb. 28/29; **delivered Apr. 20/29.**

Stadocond, hull 24, bulk freighter for Canada Steamship Lines, Ltd., Montreal; 582 L.B.P.; 60 beam; 20 loaded draft; 11 knots speed; 12,000 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 Scotch boilers; 15'3" dia x 11'6" lg.; **keel Apr. 17/29.**

Midland Prince, converted to self-unloader; deliver May 15/29 est.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Hull 149, towboat for Standard Unit Nav. Co.; 92x24x5 ft.; keel May 10/28; launched Feb. 1/29; **delivered May 1/29.**

W. W. Fischer, hull 169, diesel towboat for Central Sand Co.; 120x26x5½ ft.; 720 I.H.P.; Fairbanks-Morse diesel; keel Feb. 15/29; launch June 1/29 est.

Hull 175, ferryboat, for Cheatham Co., Tenn.; gas. eng.; 60x18x2¼ ft.; keel Jan. 2/29; **launched.**

Hull 177, tug, owner not named; Fairbanks-Morse diesel eng.; 50x12 ft.; 150 H.P.; **launched May 6/29.**

Hull 178, dredge, 100x36x8 ft.; launch 5/24/29 est.

Hulls 179-183 inc., 5 barges, 120x30x 7 ft.; **all launched.**

Hull 184, deck barge; 180 x 40 x 9½ ft.; keel Feb. 12/29; **launched May 1/29.**

Hull 185, deck barge; 180 x 40 x 9½ ft.; keel Feb. 21/29; **launched May 3/29.**

Hull 186, deck barge; 180 x 40 x 9½ ft.; keel Mar. 7/29; **launched May 10/29.**

Hull 187, deck barge, 110 x 32 x 7¼ ft.; keel Apr. 6/29; launch May 20/29 est.

Hulls 188-189, two deck barges for stock; 100x24x5 ft.; keels Mar. 21-28/29; launch May 20/29 est.

Hulls 190-191, two deck barges for stock; 75x20x5 ft.; keels Apr. 3-7/29; launch May 15/29 est.

Hull 192, deck barge for stock; 120 x 30x6 ft.; keel Apr. 2/29; launch May 25/29 est.

Hull 193, deck barge for stock; 110 x 28 x 7¼ ft.; **keel Apr. 28/29.**

Hulls 194-195, 2 deck barges for stock; 100 x 24 x 5 ft.; keels June 14-19/29 est.

Hull 196, drydock, 42 x 36 x 5 ft.; keel

July 1/29 est.
Hulls 197-199 inc., three deck barges; 100x26x6½ ft.; keels June 1-5-10/29 est.
Hull 200, towboat, owner not named; 56x14x5'6"; keels July 15/29 est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.
Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.
Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.
Viking, hull 328, steel yacht for Geo. F. Baker, Jr., 272'1" L.O.A.; 36'6¾" beam; 18'6" depth; two turbine driven G.E. motors; 2 Babcock & Wilcox WT boilers; 1200 gross tons; 2600 S.H.P.; keel July 3/28; launched Dec. 15/28; **delivered Apr. 27/29.**
Pennsylvania, hull 329, 18 - knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Oct. 15/28; launch July /29 est.
City of Elwood, hull 331, diesel conversion for U.S. Shipping Board.
Ward, hull 332, diesel conversion for U.S. Shipping Board.
Hulls 335-336, two house barges for Chesapeake and Ohio Railway Co.; keels Mar. 11/29; launch and deliver May /29 est
Not named, hull 337, passenger liner for A.G.W.I. Nav. Co., New York; 508 x 70'9" x 39'; 15,380 tons displ.; 16,000 S.H.P.; 20 knots speed; turbo-elec. drive; keel Aug./29 est.
Not named, hull 338, sister to above; keel Sept. /29 est.

NEW YORK SHIPBUILDING CO.
Camden, N. J.

Purchasing Agent: J. W. Meeker.
Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; launched Jan. 23/29; deliver July 9/29 est.
Chester, light cruiser CL- 27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.
Santa Clara, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'9" beam; 37'5" depth; General Electric turbo-electric machinery; keel Feb. 4/29; launch Sept./29 est.; deliver Apr./30 est.

THE PUSEY & JONES CORP.,
Wilmington, Del.

Purchasing Agent: James Bradford.
Acania, hull 1038, twin screw diesel yacht for Arthur E. Wheeler, New York; 126 L.O.A.; 21'6" beam; 8'6" app. loaded draft; 2 250-B.H P. diesel engs.; keel Oct. 18/28; launched Jan. 26/29; deliver May 10/29 est.
Tidewater, hull 1039, oil tanker for Tide Water Oil Co.; 225 L.B.P.; 44 beam; 15'6" loaded draft; 10½ knots speed; 2300 D.W.T.; diesel-electric power; 1000 I.H.P.; keel Jan. 12 29; **launched Apr. 23/29;** deliver June 1 29 est.
Not named, hull 1040, yacht for Fred J. Fisher, Detroit; 236 L O.A.; 34 beam; 19 depth; 12'6" draft; 2 1100 H.P. diesel engs.; keel Feb. 12/29; deliver July 15/29 est.
Rene, hull 1041, yacht for Alfred P. Sloan, Jr., New York; same as above; keel Feb. 12/29; deliver Aug. 15/29 est.
Not named, hull 1042, yacht for owner not named; same as above; keel Mar. 12/29; deliver Sept. 15/29 est.
Not named, hull 1043, twin screw diesel yacht, ordered by Cox & Stevens, Inc., New York; 168'9" long, 28' beam; two 500-B.H P. diesel eng.; deliver Dec. /29 est.

THE SPEAR ENGINEERS, INC.,
Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.
John M. Dennis, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450-I.H.P. engs.; keel Feb. 18/28; launched Dec. 15/28; deliver May 15/29 est.
Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor. keel Aug. 18/28.
City of Norfolk, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P., **keel Feb. 1/29;** launch June 1/29 est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Maryland.

Purchasing Agent: W. J. Collison.
Charles E. Evans, hull 264, fire and patrol boat for Commissioners, Washington, D.C.; 55' L.O.A.; 11'9" molded beam; 6'9" molded depth; 5' loaded draft; 31 D.W.T.; 100 H.P. Standard diesel eng.; keel Aug. 25/28; launched Nov. 22/28; **delivered Apr. 15/29.**
Not named, hull 265, steel hull, steam driven, patrol vessel for Supervisors of New York Harbor, 39 Whitehall Street, New

York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam; 10'1½" mean draft; T. E. engs.; Babcock & Wilcox W.T. boilers; keel Apr. 6/29.

SUN SHIPBUILDING COMPANY,
Chester, Penn.

Purchasing Agent: H. W. Scott.

Not named, hull 116, passenger and freight motorship for American South African Line, Inc., New York; 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs.; keel Mar. 14/29; launch Sept. 14/29 est.; deliver Nov. 15/29 est.

Blue Sunoco, hull 117, tanker for Sun Oil Co.; 245 L.B.P.; 43 beam; 15'6" loaded draft; 8 knots speed; 2300 Bessemer diesel engs.; keel Jan. 14/29; launched Apr. 6/29.

Hull 118, oil tank barge for Sun Oil Co.; 188'6" L.B.P., 31' breadth; 11'6" depth; 6000 bbls. capacity on 9ft. draft; diesel-electric propulsion; 2 Bessemer diesels, Westinghouse motors; keel Mar. 11/29; launch June 8/29 est.; deliver June 30/29 est.

Hull 119, sister to above; keel Mar. 18/29; launch July 15/29 est.; deliver June 30/29 est.

Not named, hull 120, single-screw, diesel tanker for Sun Oil Co., 13,400 D.W.T.; keel May 27/29 est.; deliver Nov. 30/29 est.

Unnamed, hull 121, steel oil barge for Tidewater Oil Co., New York; 188'6" x 31' x 11'6"; 6000 bbls. capacity on 9' draft; keel 5/20/29 est.; launch 7/18/29 est.; deliver 8/27/29 est.

TOLEDO SHIPBUILDING CO.,
Toledo, Ohio.

Purchasing Agent. Otto Hall.

Not named, hull 182, fire boat for City of Detroit; 125 L.B.P.; 29 beam; 10 loaded draft; 14 mi. speed; comp. engs.; 950 I.H.P.; 2 B. & W. boilers; deliver Aug./29 est.

TODD DRYDOCK, ENGINEERING & REPAIR CORP.,
Brooklyn, N.Y.

Purchasing Agent. H. J. Shannan.

Yorkville, hull 45, steel double - end ferryboat for City of New York, Dept. of Plant and Structure; 151 L.O.A.; 53 beam over guards; 37'6" molded beam; depth to top of beams 14'3"; draft 8'3"; steam engs.; keel Nov. 1/28; launched Mar. 28/29.

UNITED DRY DOCKS, Inc.
Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Dongan Hills, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel June 13/28; launched Mar. 19/29.

Hull 782, barge for Grasselli Chemical Co.; 150 x 38 x 12'6"; keel Feb. 20/29; launched Apr. 4/29; delivered May 4/29.

Pittsburg, hull 784, dredge hull for Atlantic, Gulf & Pacific Co.; 162 L.B.P.; 44 beam; 15 loaded draft; keel Feb. 26/29.

Hull 785, pile driver for City of New York, Dept. Docks; 56x29x7'9"; keel 3/25/29; launch 5/11/29 est.; deliver 6/1/29 est.

Unnamed, hull 790, tug for Standard Transp. Co., New York; 91'6"x22'x10'9"; 12 loaded speed; comp. eng. 500 I.H.P., 1 Scotch boiler 12'6" x11'0".

Unnamed, hull 791, tug, sister to above.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Dwight W. Davis, hull 69, steam propelled towing boat for Inland Waterways Corp., Washington, D.C.; 140x25x9 ft.; 2 500-H.P. Nordberg engs.; equipped to burn powdered coal, keel July 23/28; launched Feb. 9/29; delivered Apr. 25/29.

Tom Stallings, 74, Western river type, steam driven 30-ton snag boat for Memphis River and Harbor District, U.S. Army engineers; 127'x30x4'4"; keel Nov. 27/28; launched Feb. 19/29; delivered Apr. 17/29.

Hull 77, mooring and fascine barge for U.S. Engineering Office, Memphis; 250 x 26 x 7 ft.; keel Mar. 14/29.

Hull 78, same as above; keel Mar. 20/29.

Captain George, hull 79, single screw tugboat for U.S. Engineers office, Galveston; 65'6"x17'x7'7½"; 190 B.H.P. Winton diesel eng.; keel Mar. 29/29.

Unnamed, hull 80, steel tug, U.S. Engineers, Philadelphia; 65'6"x17'x7'7½'.

Unnamed, hull 81, yacht for Harold M. Ward, Charleston; 50 x 12 x 4 ft.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD.
Union Plant.

General reconditioning and repairs: President Adams. Dock, clean, paint: Pan American Barge No. 1, Socony Barge 82, barge Richlube (also repairs). Dock, clean, paint, misc. repairs: stmrs. J. A. Moffett, Point Bonita, Admiral Farragut, H. M. Storey, Point Corda, Ventura, Point Reyes, Trimountain, Korrigan III, Angel Island, Glymont, Pasadena, J. B. Stetson, Raymond, Jane Nettleton, Katherine Donovan, Whitney Olson, m.s. Lio, H. T. Harper, stm. schr. Brookings, Quinault, bark Star of Holland, yacht Alma, motor barge Kern, barge Rioco No. 1, tug Mariner (also make and furnish one C.I. propeller). Repair manhole covers: Chelsea. Renew valve stem: Thelma, Overhaul M.E. bearings: tug Star, m.s. Pacific Trader. Rudder repairs: Paludina. Engine repairs: San Ubaldo. Propeller for A.T. & Santa Fe Rly., H. W. Baxter (also make and furnish 1 forged steel tailshaft). Misc. repairs: stmrs. Nora, Argyll, Penmar, Pan-American Barge No. 2, Covena, Deroche, Empire Arrow, Evanger, Myriam, San Mateo, Mongolia, Point Bonita, Wairuna, Golden Gate, Saramacca, Tahiti, Esparta, La Perla, San Jose, Cadaretta, Point San Pablo, Virginia, Hartwood, m.s. Yngaren, Silverfir, Oilpioneer, Hauraki, Knute Nelson, Silverspruce, tug Pilot, ferry Tamalpais.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

Repair ice damage: stmrs. Schoharie, Magmeric. Overhaul: Liberty Glo. New bottom: tender Palmetto.

PRINCE RUPERT DRYDOCK & SHIPYARD, Prince Rupert, B.C.

Dock, clean, paint, misc. hull and mach. repairs: 14 fishing boats. Dock, clean, paint, hull repairs: 6 scows. Misc. hull and engine repairs not requiring docking: 57 fishing boats. 80 other commercial jobs.

TODD DRY DOCKS, INC.,
Seattle, Wn.

Temporary damage repairs: Doricstar. Collision damage repairs: Mauna Ala. Grounding damage repairs: A. L. Kent. General overhaul. schr. C. S. Holmes. Drydock, clean, paint, misc. repairs: President Grant, President Jackson. Dock for survey: Maltron. Misc. repairs: Admiral Rodmon, Admiral Watson, Hanley, tug Creole.

U. S. NAVY YARD,
Bremerton, Wn.

Dock, misc. repairs: Mississippi, New Mexico, Neches, Percival, Eagle No. 11. Misc. repairs to district craft: Mahopac, Tatnuck, Swallow, Challenge, Sotoyomo, Pawtucket.

Who did What--and How

The motorship Willmoto operated by the Williams Line arrived in San Francisco April 14 from the East Coast. She was formerly named the m.s. Seekonk.

The Willmoto is powered by a Burmeister & Wain, 4 cycle diesel engine with a total horsepower of 1770. The Chief Engineer, Mr. Hunter, upon his arrival at San Francisco, stated that the ship had had wonderful weather en route from the East Coast. Shell diesel engine lubricating oils are used on this vessel.

The Geo. Wallenrod Company, operators of tugs and barges, and for many years users of Shell lubricants, have recently added another tug boat and barge to their equipment. Bill Waack is General Manager and since he has taken charge the company's business has increased steadily.

Upon arrival of the Steamer Bordeaux Maru at San Francisco May 1st the Chief Engineer, Mr. Satof, put in a call for Shell turbine oil. The oil was pumped into the system of the Brown Curtis double reduction geared turbine which comprises the main engine of this steamer. The Steamer Bordeaux Maru is operated in the Kawasaki North Pacific Service and is one of the 12 steamers of this company that make San Francisco a port of call.

Mr. Satof states that excellent results are obtained from Shell marine oils and his engine department is very well pleased with the performance of Shell lubricating oils.

The National Navigation Lines are again operating some of their vessels to Pacific Coast ports. During the uprising in Mexico several of the Government merchant vessels were held by the rebels.

The Steamer Moctezuma was at San Francisco during April and the S.S. Bolivar arrived here during the month of May. Regular sailings will again be in effect soon according to word received from the offices of James Rolph III, who are General Agents for the National Navigation Lines.

These vessels are using Shell marine oils and have been for several years. Captain Bonilla, who is acting as Port Engineer as well as Port Captain, always has a good word for the quality of Shell products.

Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

E. Grant Rowley, the oldest chief engineer in the service of the Panama Mail Steamship Company, reports that he is feeling fit and fine, after a seige of illness. He is again master of the propulsion department aboard the liner Corinto.

Roy V. Crowder, passenger traffic manager for the Los Angeles Steamship Company, will return to San Francisco early this month after an extended tour of key cities in the East. During his trip, Mr. Crowder conferred with steamship, travel, and railroad leaders.

T. B. Danckwortt, diesel engineer of the **Union Oil Company**, was a recent visitor in San Francisco. The Union Oil Company inaugurated a diesel engineering service for the benefit of all diesel engine owners and diesel engine builders several years ago, and succeeded in bettering the performance records of many diesel plants, besides solving fuel and lubricating oil problems for the various engine types.

Since the Union Oil Company is furnishing its products for motorships of all nations with diesel engines built anywhere in the world, this service and advice for getting the best results out of every engine with Pacific Coast fuels are greatly appreciated by shipping firms, and the Union Oil Company deserves credit for being the first of all oil companies to offer such cooperation.

The Union Oil Company is to be congratulated for having obtained the services of Mr. Danckwortt, who is recognized as one of the leading authorities in the diesel engineering field. His wide experience with practically every type and size of diesel engine built and his extensive knowledge of combustion chamber problems and injection systems have been a great help to the diesel engine industry in extending the range of asphalt base fuels that can be burned successfully.

Appointment of two San Francisco Bar Pilots was made by Governor C. C. Young on March 18. **Captain Arthur** Self, former master of the **Lassco** liner City of Honolulu, and **Captain Donald Guthrie**, master of the **Dollar** around-the-world liner President Harrison, were the shipmasters receiving the coveted appointment. The appointments became effective on April 1.

Appointment of the two skippers followed the resignation of **Captain John J. Moreno**, due to ill health, and the assignment of **Captain Harry W. Lewis** as acting port captain, replacing Captain John Wallace, who has been confined to his home due to a protracted illness.

W. C. Wallace, surveyor in the British Columbia territory for The British Corporation Register of Shipping and Aircraft.

Resignation of Captain Moreno was not entirely unexpected as he has been in poor health for many months. Captain Moreno is one of the best known pilots in the Association. He was appointed in 1925, while master of the old Pacific Mail Steamship Company's liner President Taft. He has been a noted figure in transpacific maritime commerce for more than a quarter of a century.

Captain Arthur Self is well known. He has been master of the Lassco liner City of Honolulu since the vessel was placed in commission, and prior to this command he was for many years skipper of the coastwise liner Yale.

Captain Donald Guthrie is the "baby" of the Association, being only thirty-one years of age, the youngest pilot ever appointed, it is stated. He is the son of the late Captain James Guthrie, one-time inspector of hulls and boilers. He received his master's papers when he was twenty-five years of age. Captain Guthrie served on vessels of the Matson Line and Admiral Line before joining the Dollar service.

Portland, Oregon, announces the advent of the **Klaveness Line** in the Pacific Coast-Asiatic service from Portland and other principal Pacific Coast ports to Shanghai, Hongkong, Singapore, Sumatra, and Java with a possible extension to Penang and Sweetenham, starting with five vessels, the first of which will be either the motorship Sommerville or Bronxville. This is the word received from Oslo by **Ernest E. Johnson Company** of Portland from A. F. Klaveness who recently spent several weeks on the Pacific Coast looking into the trade possibilities. Los Angeles, San Francisco, Portland, Puget Sound, and British Columbia are named in the line-up of coast ports. Johnson Company will act as Portland and Seattle representatives, **A. C. Darroch** will be British Columbia agent, and California agents are yet to be selected.

"More Efficiency" is the reason given by officials of the **White Star** and **Royal Mail Steam Packet Company**, two of Britain's greatest shipping concerns, for placing the ban on girl workers. Discussion of screen stars, powdering of noses, silk-shod knees to divert the attention of male workers, as well as dimpled cheeks and coquettish smiles will soon be passe in the headquarters of these lines. Young men from 19 to 25 are to replace the girls. Letters of protest poured in on the newspapers following the action and the subject was the matter of much comment in London.

Zac George, well known executive of the Luckenbach Line was the

winner of a golf trophy in the recent tournament staged in San Francisco by the steamship fraternity but lost his prize for some twenty-four hours after it was presented to him. Close investigation revealed that a friend had decided to mind it for him unbeknowest to George who searched the highways and byways and was a picture of gloom until it was returned.

Nippon Yusen Kaisha liner Chichibu Maru, third of three 16,800-ton passenger and freight liners building for the San Francisco-Oriental service, has been launched at Yokohama. It will be somewhat different from the Asama Maru and Tatsuta Maru, recently launched, according to **Takeo Yamamoto**, San Francisco manager. It will be 585 feet long, with 72 feet beam, and will have accommodations for 820 passengers in all classes, having seven decks. While the Asama Maru and Tatsuta Maru will have two stacks the Chichibu Maru will have but one. This single stack will be 96 feet in circumference and big enough to house 12 automobiles if it were a garage. A speed of 19 knots is guaranteed.

The Asama Maru will arrive in San Francisco in October on her maiden voyage, the Tatsuta Maru about March 15, and the Chichibu Maru several weeks later.

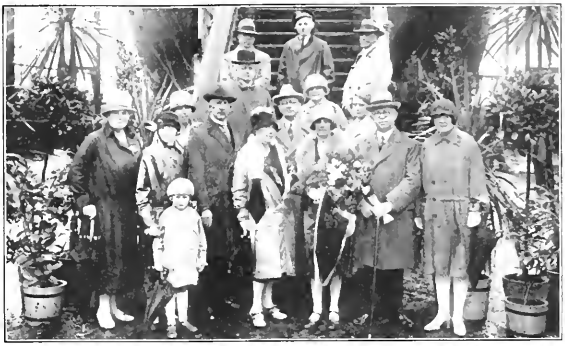
Sixteen new ships are to be added to the lines of the **General Steamship Corporation**, according to officials of that company. Three new refrigerator liners are under construction for the **Kerr Line** and will be put into service in the fall; and three additional craft are to be constructed later. Upon entering the service schedules will be revised.

Transatlantic Steamship Company will add another ship to the Australian service.

The **Westfal-Larsen Line** is completing the Brimanger, Hindanger, and Villanger, 10,000-ton motorships, and two others have been ordered. The ships are to be equipped with refrigerator facilities and placed in the Brazil and River Plate trade.

Four 12,000-ton refrigerator ships are under construction for the European service of the **French Line**. Two are steamers and two are motorships. They have been named Wyoming, Wisconsin, Oregon, and Washington. The first will come out early in the fall.

There have been rumors that the **Libera Line** is planning construction of two combination passenger and freight liners for the San Francisco-Mediterranean service, with a capacity of 200 passengers.



Party of officials at the launch of the tanker California Standard, Krupp's yard, Kiel. Mr. and Mrs. R. C. Warner and their two daughters at the right of the front row. Miss Margaret Warner was sponsor of the vessel.

More than fifty relatives and friends were present at the twenty-fifth wedding anniversary celebration of Chief Engineer **Alexander Ryan** and **Mrs. Ryan** late last month in their home in San Francisco.

Mr. Ryan, head of the engineering department of the liner Sierra, is a veteran transoceanic chief engineer and is known to thousands of travelers between San Francisco and the South Seas and Australian ports.

Many beautiful gifts were presented the popular couple by relatives and friends.

Captain Donald Guthrie, who has recently been appointed a San Francisco Bar Pilot. Captain Guthrie is thirty-one years of age and is the youngest skipper ever appointed to this position.

Few persons, outside of intimate friends, were aware that **Paul Wadsworth Chapman** was a power in the financial, commercial, and industrial world until his purchase of the United States Lines and the American Merchant Line, which included taking over of the liner Leviathan.

Mr. Chapman was not born on the seacoast. Far from it. He first saw light of day on a small farm at Jerseyville, Illinois, in 1880. He is unassuming, a man of slender build. But he is a commanding figure in the world of banking, railroading, aviation, transportation, and public utilities.

To attend the sessions of the International Coffee Conference, **Daulton Mann**, general manager of the Panama Mail Steamship Company is now in Paris, having left San Francisco several weeks ago. This annual gathering deals with important problems of the extensive coffee shipments from the Latin Americas to all parts of the world. Ships of the Panama Mail line handle a considerable amount of the annual coffee output of the Central Americas. Upon his return to New York, Mann will spend several weeks visiting the offices of the Panama Mail Line on the eastern seaboard.

Fred L. Nason, general agent at San Francisco for the Canadian Pacific Line, recently received details of the gigantic liner with which Canada will make her bid for trade across the Atlantic. The vessel will be known as the Empress of Brit-

ain and when completed will be of 40,000 gross tons, the largest ever planned for the Canadian Atlantic trade. She will be the first ship in the world to have an entire deck devoted to sports. The vessel will be 730 feet long, a beam of 97.6 feet, and will carry first class, tourist third cabin, and third class. Her total accommodations will be only 1100 passengers, which conveys some idea of the type of accommodations to be offered when comparison is made with the 20,000 ton liners of the same company which, rated among the finest cabin liners afloat, have accommodations for 1600 passengers.

International Conference on Safety of Life at Sea developed wide divergence of views on the subject of helm orders, their meeting minutes reveal. Sessions were held in London by the navigation committee, which was informed by representatives from Germany that that nation had changed from indirect use of the words "port" and "starboard" to direct use of these words. They further stated that this had been done only after an interval of six years during which time the words "left" and "right" were used. Holland has changed from the indirect to the direct use of port and starboard, Norway has adopted "left" and "right" which has been in current use for eighteen years. After discussion it was agreed that it was desirable to adopt internationally the words "left" and "right."

Cabin class ships in transatlantic service have proved profitable to ship operators who report a large volume of business in these new and popular one-class carriers. As a result the motor liner Lafayette of the French Line, which was launched recently at St. Nazaire, is to be a cabin class ship, according to **Captain B. Aillet**, Pacific Coast manager of the French Line. The vessel will be completed in 1930. She is 600 feet long and of 21,500 tons.

The well-known Pacific Steamship Company liner **Ruth Alexander** recently completed a world tour for the Dollar Line, having been substituted for the President Adams, while the latter was undergoing repairs and renewals which make her the outstanding vessel in the round-the-world service as far as passenger accommodations are concerned.

Intercoastal sailings on a ten-day basis from the ports of Baltimore, Norfolk, Savannah, and Jacksonville are announced for the **Arrow Line** by its Pacific Coast agents, **Sudden & Christensen.** Previously sailings were fortnightly. The first carrier on the new schedule will be the Jane Christensen from Baltimore June 6. Three of the steamers recently acquired from the Shipping Board have been renamed as follows: West Hosokie to Constance Chandler; West Wauneka to Dorothy Cahill; and West Bridge to Barbara Cates.


Captain J. M. Hewison, master of the tug Salvage King.

Hoisting of the United States Naval Reserve flag to the masthead of the **American-Hawaiian** steamer **Columbian** in San Francisco harbor marked the fourth vessel of that line to receive this honor. In the presence of the ship's commander and officers of the vessel, the ceremony was performed by **Commodore George W. Bauer**, Commodore F. L. **Heichmuth** and Commander W. C. **Tooze** of the Twelfth Naval District. Officers of the Columbian are: **C. H. Bruun**, captain; **T. J. Butler**, chief officer; **C. C. Foster**, second officer; **J. K. Simmons**, third officer; **J. J. O'Neil**, fourth officer; **W. Clift**, chief engineer; **A. Oak**, first assistant; **J. Wassel**, second assistant.


Captain C. D. L. Tervutsos, operating manager for the Canadian Pacific Steamship Services at Victoria, British Columbia.

The East Asiatic Company of Copenhagen has definitely decided to compete for trade across the Pacific and has announced that two new motorships are being constructed for the Pacific trade and that four others are contemplated. This was the decision of officials of the company following an extensive investigation and survey of trade possibilities in the western ocean.

Although none of the vessels will be placed in service this year, it is possible that the company will charter several to take care of heavy demands.

A big celebration will open the new **Parr Terminal** at Richmond, California, in September. It will be held under the auspices of the chamber of commerce. The **Nelson Steamship Company** has already signed up to call at the new terminal in July, although construction will not be completed until the formal opening in September.

San Francisco steamship owners are going to take up the matter of securing additional customs inspectors with the Washington government. There are only twelve inspectors on duty at the local port. An increase in the force was promised three years ago but no new men have been put on and shipowners claim they are losing valuable time when their ships are inspected upon arrival. In 1924 the local inspection force handled 1,051,137 tons gross and in 1927 the total was 1,250,000 tons. Additional inspectors will relieve a serious situation, is the claim of shipping men.

The death of Captain **George Enos**, veteran tugboat skipper of the Pacific Coast, was reported from Oakland, California, on Saturday, May 11. Captain Enos was known in maritime circles the world over.

San Francisco's Steamship Golf Tournament Launched

"Why does my father curse and shout?"
The captain's daughter cried.
"Is his store of liquor running out
Or have we missed the tide?"
"Hush, hush, my child," her mother said
"When he was last ashore
The handicappers at the club
Put ten strokes on his score."

From HIGH SEAS to HIGH SCORES

Our mariners of olden days
Were salty ocean toilers,
Whose language could be sawed in cords
To fire up the boilers.
I weep to think that we have come
On days when men like these
Should speak of traps and handicaps
And mashie shots and tees.

J. A. Q.

PRIZE WINNERS

Low Net

	Gross	H'cap	Net
A. C. McLaughlin	83	18	65
First Flight			
T. E. Cuffe	87	4	83
Roger D. Lapham	88	4	84
W. Reed	91	12	79
S. A. Livingston	91	12	79
Second Flight			
H. M. Huff	87	14	73
Arnold Foster	93	14	79
Ed Schneider	95	15	80
Dr. Walter Twiggs	95	14	81
Peter Jurs	95	14	81
A. R. Page	95	14	81
Third Flight			
R. F. Tomlinson	87	16	71
E. A. MacMahon	87	18	69
H. J. Anderson	93	18	75
E. W. Horsman	94	16	78
Fourth Flight			
David Young	94	20	74
J. C. Strittmatter	100	20	80
J. M. Evans	105	20	85
Z. T. George	106	20	86
Fifth Flight			
S. G. Walton	93	24	69
J. J. Tynan, Jr.	95	24	71
R. W. Bybee	103	28	75
J. J. Tynan, Sr.	102	24	78

Also Ran

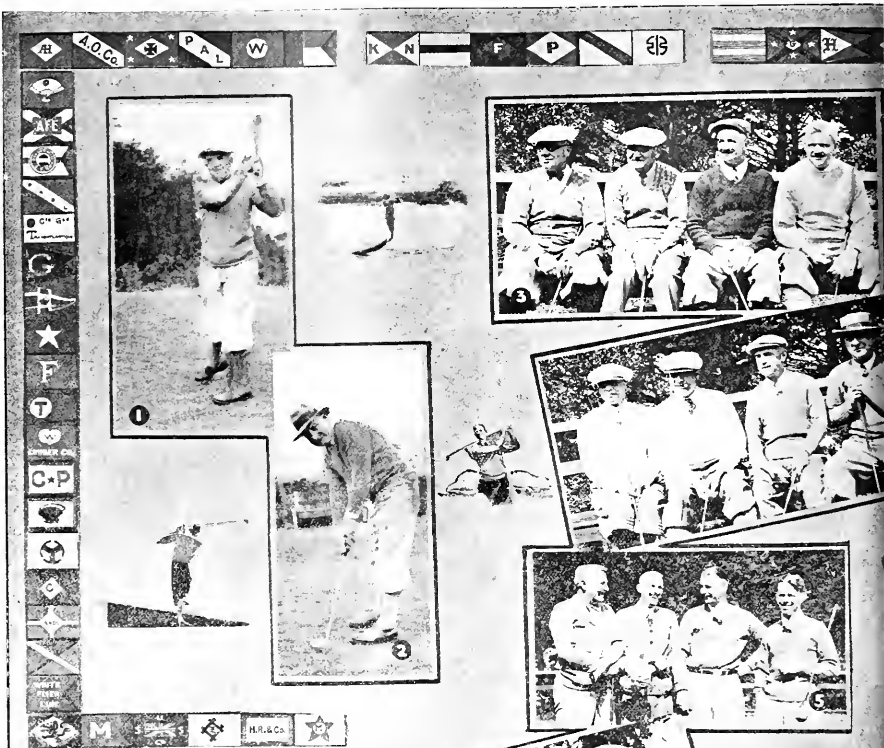
First Flight

	Gross	H'cap	Net
Walter Shelton	90	5	85
H. J. Bennett	91	8	83
F. Coyle	90	8	82
Stewart Crawford	103	8	95
W. P. Hugo	95	8	87
H. C. Hays	93	8	85
H. R. Struthers	91	8	83
Oliver J. Olson	89	8	81
H. F. Vincent	92	8	84
B. L. Haviside	88	8	80
H. B. Adams	91	10	81

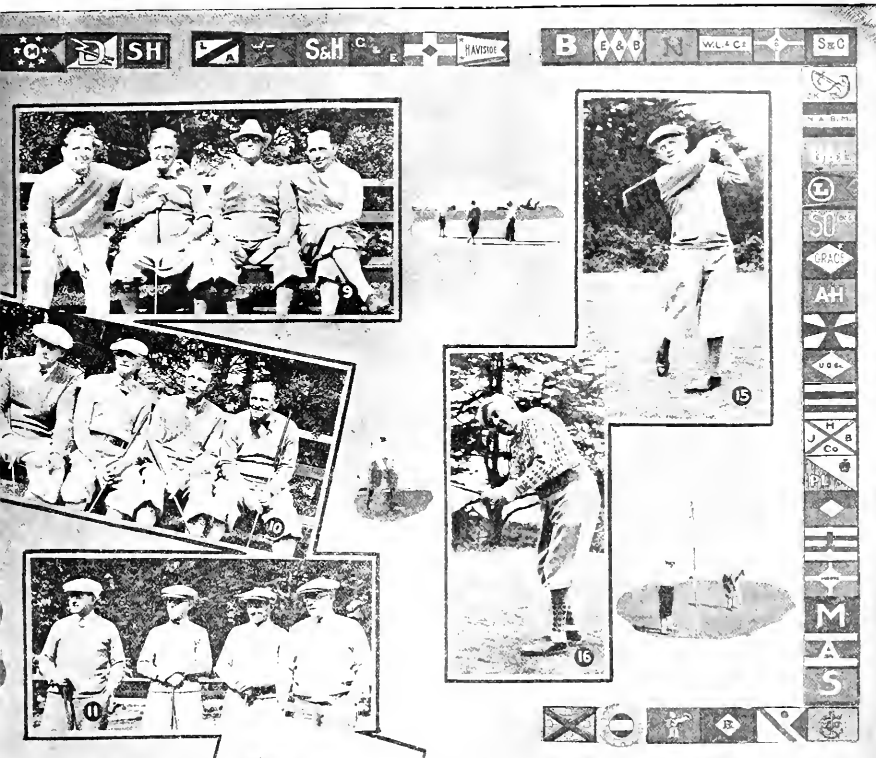
A. C. McLaughlin

L. H. Cloud	103	10	93
Daulton Mann	92	10	82
William C. Empey	100	12	88
J. H. Anderson	103	12	91
E. Lyons	98	12	86
James S. Hines	119	12	107
George Hart	97	12	85
S. A. Livingston	91	12	79
L. C. Stewart	92	12	80
Second Flight			
W. A. Ross	97	14	83
G. D. Zeh	100	14	86
Thomas Crowley	104	14	90
J. L. King, Jr.	103	14	89
Edward G. Egbert	105	14	91
W. P. Dwyer	125	14	111
Claude Daly	115	14	101
A. E. Gillespie	96	14	82
Phillip A. Coxon	113	14	99
John Parker	98	14	84
James Madison, Jr.	96	14	82
Paul Faulkner	118	14	104
Harry Brown	107	14	93
D. D. Stevenson	108	14	94
George U. Hind	103	15	88
Third Flight			
D. D. McGregor	108	16	92
R. G. Sullivan	103	16	87
F. M. Barry	111	16	95
F. J. O'Connor	102	16	86
J. C. Rohlfs	98	16	82
Walter Casey	129	16	113
E. H. Green	117	16	10[illegible]
E. E. Eyre	100	16	84
Fourth Flight			
R. W. Myers	119	20	99
H. T. Earl	130	20	110
D. Dorward	109	20	89
N. Randall	113	20	93
L. L. Collins	114	20	94
Norman Vincent	118	20	98
L. S. Swayne	110	20	90
Thomas B. Esty	127	20	107
John T. Greany	114	20	94
C. D. Patterson	108	20	88
L. Curtis	128	20	108
W. J. Mahoney	113	20	93
O. P. Cottrell	111	20	91
Thomas Foster	117	21	96
R. O. Houghton	122	22	100
Fifth Flight			
L. D. Jurs	118	24	94
P. G. Williams	135	24	91
Com. J. H. Blackburn	110	24	86
George T. Yater	112	26	86
Capt. G. T. January	127	26	101
H. B. Haney	108	26	82
Pierre Lacombe	132	26	106
W. J. Kelly	110	26	84
J. N. Eschen	112	27	85
H. W. Mears	110	27	83
M. R. Hickman	110	27	83
W. E. Martin	115	27	88
S. N. Slingerland	128	28	100
M. J. Lindsay	119	28	91
H. F. Haviside	119	28	91
E. C. Evans, Jr.	124	28	96
W. J. Gray, Jr.	131	28	103
W. R. Brenner	122	28	94
R. S. Silva	137	28	109
W. E. Usher	141	28	113
Capt. Tom Smith	130	28	102
M. C. Collarino	110	28	82

S. S. "Golf Tournament"



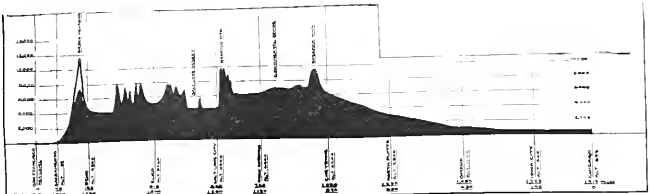
1. Ralph Myers keeps his head down.
2. Frank O'Connor using Ardent Grip.
3. F. Barry, Harry Struthers, Bill Empey, Roger Lapham.
4. Walter Twiggs, Ralph Sullivan, T. Crowley, Joe King.
5. W.E.Usher, W.R.Bremner, W.J.Maloney, S.G.Walton.
6. Roger Lapham warming up.
7. Harry Struthers drives at 6th tee.
8. 3rd green, "Arrived, All's Well."



9. J.J.Tynan,Jr.,J.J.Tynan,Sr.,H.Haviside,B.L.Haviside.
10. Louis Jurs, Peter Jurs, Fred Kobely, R. O. Houghton.
11. A.Cahill, J.Lowden, E.A.MacMahon, L. C. Stewart.
12. John Rohlfs gets his bearings.
13. California's 4th fairway.
14. Trap shooting at 6th hole.
15. John Greany, around in 114.
16. Arnold Foster pitches one dead.
17. Roger Lapham addressed us at tees and banquet.

Photos by Arthur Mills, San Francisco.

Wireless Phones for Airships

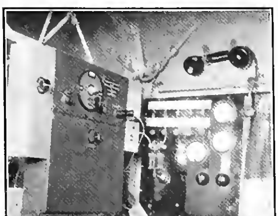


BOEING SYSTEM MAP PROFILE MAP OF WORLDS LONGEST AIR MAIL ROUTE CHICAGO - SAN FRANCISCO

FOR some years the technical organization of the Boeing Air Transport, Inc., has been carrying on experiments and research looking to the perfection of radio communication between pilots on planes in the air and between the pilot of the plane in the air and ground stations. These experiments have reached a degree of success so that Boeing pilots are now talking with ground stations from altitudes up to 12,000 feet. It is remarkable that, up to 12,000 feet, the higher the pilot the more distinctly he can hear the ground operator. Commercial experiments carried on by the Boeing company ended at 12,000 feet because that elevation is the maximum at which planes are required to fly on the transcontinental and coastal routes of that company.

Boeing pilots are now being given weather reports, dispatching orders, and advice with reference to the positions of other planes in ample time to insure practical safety. Pilots on planes as distant as 175 miles can, under favorable conditions, phone to each other. The Boeing pilot flying east from Oakland, California, can talk directly to a Boeing pilot flying west from Elko, Nevada; and at distances greater than 175 miles apart interplane communication can be transmitted through ground stations.

As the result of these experiments, twelve ground radio stations are under construction or authorized by the Boeing Air Transport, Inc. These stations are located at Oakland, Sacramento, Reno, Elko, Salt Lake City, Rock Springs, Cheyenne, North Platte, Omaha, Des Moines, Iowa City, and at Chicago municipal airport, the eastern terminus of the Boeing system. This covers the airmail route from Chicago to San Francisco, the longest commercial airmail route in the world.



Wireless telephone apparatus installed aboard a Boeing air transport. The entire equipment weighs just 100 pounds.

Many difficult problems have been overcome in bringing about this satisfactory result. Some of these were: Providing of sufficient electric power in plane to modulate intelligibly for distinct transmission; development of a supersensitive receiver to pick up and multiply without distortion weak signals far below the level of the ordinary broadcast; the design of radio equipment light and compact enough not to interfere with the commercial load and space in the plane.

As worked out, the radio phone equipment installed weighs just 100 pounds. An 8-foot Dural antenna is mounted vertically on the top wing and stream lined to reduce its wind resistance. This antenna serves for both transmission and reception. A head gear was designed for the pilot consisting of soft rubber plugs with phonettes attached fitting comfortably in his ears and connected to the receiver with a fine silk cord, the microphone transmitter being mounted on a helmet directly in front of his lips. A single throw switch changes from transmission to reception, and control is practically automatic.

The ground station employees must be licensed operators. Pilots in planes require only a certificate showing knowledge of radio laws and the ability to operate the radio set.

When the ground station equipment has been completely installed it will be possible for the Boeing pilots to talk to ground stations during every minute of the 2000-mile flight between the Great Lakes and the Golden Gate. Under the system it would be possible for travelers in passenger air transports so equipped to talk to city numbers by calling a terminal station and asking to be connected with a house. At present, however, the Department of Commerce permit for this service limits it to messages dealing with the operation of the planes and the protection of life and equipment.

TRADE NOTE

Pacific Marine Supply Co. of Seattle, headquarters for ship supplies, has purchased the Seattle ship chandlery firm of Weeks-Howe Company. The Pacific Marine Supply Company is the largest firm in Seattle carrying supplies for the marine trade, and occupies a 7-story building at 1217 Western Avenue.

A Boeing pilot equipped with head gear for wireless conversation to the ground stations or to other planes.

New Grace Liners for South American Service

WITH the sailing of the new twin-screw motorship Santa Inez on April 20, the Grace Line inaugurated a new fast and direct service between New York, the Panama Canal, and ports on the Pacific coast of Colombia and Guayaquil, Ecuador. A sistership, the Santa Rita, will follow the Santa Inez on June 8.

This will be the first direct passenger service from New York to Buenaventura, Colombia, and Guayaquil, Ecuador. The run to the first port will be shortened to eight days and the Guayaquil run to twelve days.

Buenaventura is becoming one of the most important seaports on the West Coast of South America as it is now directly connected by rail and motor highway with Bogota, the capital of Colombia, which can be reached from Buenaventura in thirty-six hours. Much of the travel movement from the interior of Colombia which used to find its exit from the country via the Magdalena River and Caribbean Colombian ports is now passing through Buenaventura and the entire Pacific coast of Colombia is responding to the improved communications.

Similarly the new service will be of great importance to Ecuador as Guayaquil its principal port has remained comparatively inaccessible because of the length of time required to make connections from the Panama Canal or from Peruvian ports.

After calling at Colombia and Ecuador the Santa Inez and the Santa Rita will call at Peruvian and Chilean ports down the West Coast as far as Valparaiso, Chile.

These new motorships are of 9000 tons displacement, 370 feet long, 53 feet beam, with twin screws driven by diesel engines developing 4500 horsepower. There are four decks with first class passenger accommodations for 70 persons and accommodations for 48 intermediate class passengers. They are built to maintain a service speed of 14 knots and the cargo capacity is 5,100 tons.

A swimming tank, space for golf practice, wide decks for dancing, sports, or the deck chair siestas invited by the tropics are interesting features of the ship arrangement. On the promenade deck are situated the social hall, lounge, smoking room, and veranda cafe. There are no inside staterooms and beds instead of berths are the rule.

The new Grace Line cargo and passenger motorship Santa Inez.

The Santa Inez has a cruiser stern and straight stem; the hull is subdivided by complete watertight bulkheads and insulated chambers are provided for carrying of the ship's provisions as well as fruit and other perishable freight.

The plumbing, heating, sanitary, and ventilation fittings are of the highest class and the Thermotank Punkah Louvre system of ventilation is fitted throughout to meet the varying range of climatic conditions experienced on the voyage.

Culinary and laundry departments are all electrically operated with the most modern equipment including electric cooking ranges both for passengers and crew. There is a purser's bureau and a barber shop and ample baggage, mail, bullion and storerooms are provided. Special thermostatic electric fire detectors are installed throughout the cargo space as well as the passenger accommodations and a complete chemical fire extinguishing system is fitted throughout the vessel in compliance with American shipping regulations. Deck machinery is all electrically operated. There are nine winches and four hatches with especially large openings for the easy loading and discharge of cargo.

The Santa Inez is built to comply with the highest standards of the United States and Lloyds' regulations.

The Santa Cruz and Santa Cecelia, which have been maintaining a service of the Grace Line since 1927, call at Puerto Colombia and Cartagena, Colombia, before passing through the Panama Canal and will continue as hitherto.

TRADE NOTES

An arrangement has been made whereby the **Johnson, Joseph and G. M. Josselyn and Co.** of San Francisco will handle the distribution and sale of **Goodrich Cutless Rubber** marine bearings up to $2\frac{3}{4}$ inches for Central California.

C. V. Lane of San Francisco retains the distribution of this line in sizes 3 inches and up.

Robert D. Black, advertising manager and W. A. Rowe, production manager of the **Black & Decker Mfg. Company**, Towson, Maryland, have just returned from Europe where they spent several months at the factory of Black & Decker, Ltd., Slough, Bucks, England and in visiting many of the European markets. They included in their trip a visit to the Leipzig Fair at which the Black & Decker Mfg. Company had an exhibit of their Portable Electric Tools.

Charles Strom, who was formerly with the Fiske Tire and Rubber Company has recently joined the export sales department of the Black & Decker Mfg. Co. and, after a short stay at the factory in Towson, will represent this company in foreign markets.

Freights, Charters, Sales

May 15, 1929.

The following steamers have been reported fixed with grain to U.K. - Continent: British str. Northmoor, Portland, Puget Sound to U.K./Continent, 29/-, May June, Kerr, Gifford & Co.; British str. Bennevis, Portland, Puget Sound to U.K./Continent 29/-, option Vancouver, B.C., 1/3 less, May/June, Kerr, Gifford & Co.; British str. Benvenne, North Pacific to U.K. Continent, Aug., Canadian American Shipping Co.; British str. Benarty, North Pacific to U.K./Continent, July, Canadian American Shipping Co.; British str. Benvorlich, North Pacific to U.K./Continent, June, Canadian American Shipping Co.; British str. Orangemoor, Portland, Puget Sound, 29/-, option Vancouver 28/9, to U.K./Continent, June, Kerr, Gifford & Co.; British str. Bennevis, North Pacific to U.K./Continent, Sept., Canadian American Shipping Co.; British str. Rio Claro, Portland, Puget Sound, 29/-, option Vancouver 1/3 less, July, Kerr, Gifford & Co.

The American str. Wekika has been fixed with lumber from Yaquina Bay, Grays Harbor, and Columbia River to Poughkeepsie, by A. C. Dutton Co., May.

The British str. Copeman has been fixed with lumber from Vancouver to U.K./Continent, prompt, W. L. Comyn and Co.

The following time charters are reported: Swedish str. Siljan; delivery San Francisco, redelivery U.S. North of Hatteras via North Pacific, $1.45, Apr./May, Canadian Transport Co.; Norwegian str. Flint No. 2, delivery and redelivery North Hatteras via North Pacific, $1.10, Apr., Canadian Transport Co.; British str. Bencruachan, delivery Pacific Coast, redelivery U.K./Continent, $1.60, Apr., Bruusgaard Line; British str. Dalworth, Pacific Trade 6 to 9 months, delivery and redelivery U.K./Continent, 4/4½, Canadian Transport Co.; British m.s. Oakworth, delivery Japan, redelivery North Hatteras via North Pacific, $1.45, May June, Canadian Transport Co.; Norwegian str. Gro, delivery Norfolk, redelivery North Hatteras, via North Pacific, $1.10, W. L. Comyn & Co.; Norwegian m.s. Tyr, Pacific trade 2 years, delivery Antwerp, May, W. L. Comyn & Co.; British str. Vulcan City, one trip, delivery Japan, redelivery U. S. North of Hatteras, via North Pacific, $1.05, May.

The following sales are reported: American str. Emergency Aid U. S. Shipping Board to McCormick Steamship Co.; American tk. strs. Meton and Dilworth, U. S. Shipping Board to Antietan Co., Philadelphia; British strs. Canadian Rover, Canadian Coaster, and Canadian Observer, $150,000, Canadian National Steamships to Empire Shipping Co., Vancouver; U. S. A. Tr. Thomas, $63,000, U. S. Government to American Iron & Metal Co., Oakland.

PAGE BROTHERS, Brokers.

Approved Operating Agreements

THE following important agreements filed in accordance with Section 15 of the Shipping Act were approved by the Shipping Board April 24:

An agreement between **Sudden & Christenson** and **Los Angeles Steamship Co.** The agreement covers maintenance of a joint service under the designation of the Arrow Line between United States Atlantic Coast ports and Pacific Coast ports from San Diego, California, to Vancouver, British Columbia, inclusive. Sudden & Christenson undertake to enter four steamers and the Los Angeles Steamship Company three steamers in the service and each is morally obligated not to withdraw any of these vessels in such manner as to interrupt a minimum fortnightly service. Should it be considered advisable to increase the frequency of service, Sudden & Christenson reserve the option of entering additional steamers; while Los Angeles Steamship Company may enter additional steamers only at the option of Sudden & Christenson.

Either party may withdraw upon one year's notice in writing. The present agreement is designed to supersede a joint service arrangement between Sudden & Christenson and Columbia Pacific Shipping Company, approved by the Board August 2, 1926.

An agreement between the **Westfal-Larsen Company Line, Pacific-Argentine-Brazil Line, and The Blue Star Line,** in which provision is made for the maintenance of uniform freight rates as agreed upon from time to time in conference in the trade between Pacific Coast ports and Argentina, Brazil, and Uruguay.

Decisions are to be by unanimous vote of members present at meetings, and any common carrier in the trade may become a party to the agreement by subscribing thereto, while members may withdraw upon 60 days' written notice.

Unjust discrimination, payment of rebates or compensation to any shipper, contractor, broker, or receiver of cargo; acceptance of cargo at less than actual gross weight or measurement, payment of freight in other than currency of the United States or its equivalent; payments or refunds in respect of freight or compensation received, or absorption of rail or coastal steamer freights, or other charges at loading or discharging ports, are prohibited. Payment of commission or brokerage is also prohibited unless agreed upon by the parties. Provision is made for arbitration of disputes between parties to the agreement.

Bull Insular Line, Inc. with **United States Lines:** Through billing arrangement covering shipments between Bremen and Porto Rican ports, with transshipment at New York. Through rates are to be based on direct line rates and apportioned three-sevenths to the United States Lines and four-sevenths to Bull Insular Line, the latter to absorb cost of transshipment.

Calmar Steamship Corporation with **American Mail Line:** Arrangement covering through movement of shipments from Baltimore and Philadelphia to Far East ports of call of the American Mail Line. Through rates are to be apportioned equally between the lines, each of which assumes 50 per cent of cost of transferring cargo at San Francisco; inward tolls to be absorbed by Calmar and outward tolls by American Mail Line.

Panama Mail Steamship Company with **Hamburg American Line:** Agreement covering through shipments of canned goods and dried fruit from San Francisco and Los Angeles Harbor to European ports served by the Hamburg American Line. Through rates are to be based on direct line rates and apportioned equally between lines, each of which assumes one-half the cost of transshipment at New York.

Pacific Marine Review

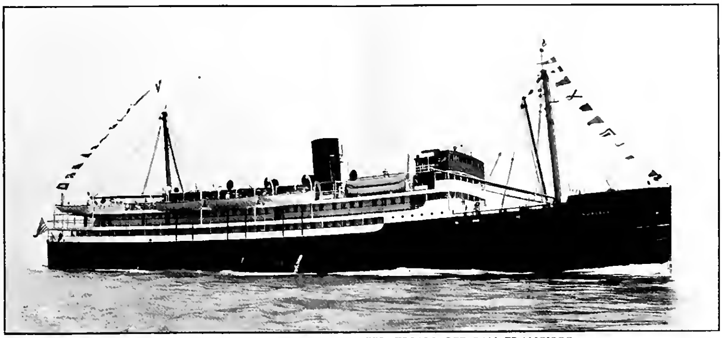
The National Magazine of Shipping

JULY, 1929

Official Organ
PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION

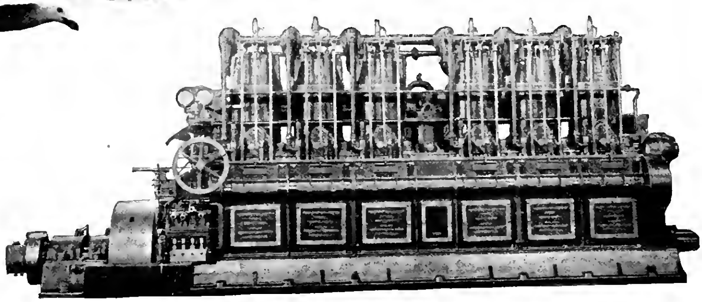
Pacific Marine Review, Vol. 26, No. 7, Published Monthly at 576 Sacramento Street, in San Francisco, Entered as second class matter at the post office at San Francisco under the act of March 3, 1879.



STEAMSHIP HUALALAI ON HER SPEED TRIALS OFF SAN FRANCISCO

It is very seldom that the product of a shipbuilding plant and an engineering corporation gives such complete satisfaction as to produce within twelve months an order for exact duplication. The work of the Potrero Works of the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd. and the Westinghouse Electric & Manufacturing Company in producing the passenger and cargo geared turbine steamer Waialeale for the Inter-Island Steam Navigation Company of Honolulu was the subject of congratulation on this page of Pacific Marine Review in July 1928. We now offer congratulations on a duplicate of that job for the same owner. A cablegram from Honolulu announces to Bethlehem executives that "Hualalai arrived Honolulu 6:00 a. m. Tuesday, the 11th, three hours ahead of schedule. Highly pleased with voyage. Again congratulate Bethlehem."

Perfect Engine Performance



Washington Diesels are outstandingly preferred by Fishermen and Commercial users.

They find the low fuel consumption and mechanical dependability of these sturdy marine units an important factor in the financial success of their craft.

Whether it be fishing, towing, ferry or private yacht, there is a Washington Diesel, from 44 to 1800 horsepower, to fulfill your requirements with unfailing satisfaction.

WASHINGTON IRON WORKS

Before You Buy

Let our representative show you an actual installation. Your knowledge of the facts concerning these remarkable marine units will help you choose more wisely.

WASHINGTON IRON WORKS
General Offices: Seattle, Washington
Portland Office: 524 Marshall Street

British Columbia Representatives: Vancouver Machinery Depot, Ltd., Vancouver, B. C., Canada. Honolulu Representatives: Perine Machinery Company, Inc., 610 Stangenwald Bldg., Honolulu, T. H. Oregon Representative: F. C. Purinton, Phone 62, Tigard, Ore. Eastern Representative: Sexton Engineering Corporation, 136 Liberty Street, New York City, N. Y. California Agents: W. H. Worden Co., Inc., San Francisco, Calif.; Ward-Livesly Co., Los Angeles, Calif. Southern Representative: Eclipse Engineering Co., 321 Chartres St., New Orleans, La.

WASHINGTON DIESEL ENGINES

Pacific Marine Review

The National Magazine of Shipping

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

Entered as second class matter June 20, 1913, at the post-office, San Francisco, under the Act of March 3, 1879. Entire contents copyright, 1928, by J. S. Hines. Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 15th. Subscription price, a year; domestic, $2; foreign, $3; single copies, 25c.

Official Organ
Pacific American Steamship Association

James S. Hines,
President and Publisher.

Bernard N. De Rochie,
Vice-Pres. and Manager.

Official Organ
Shipowners' Association of the Pacific

Alexander J. Dickie,
Editor.

Paul Faulkner,
Advertising Manager.

A California School Ship

WHEN Governor Young of California signed Assembly Bill 253, one long cherished dream of shipminded Californians became a reality. This bill appropriates $115,000 for first two years operation of a State nautical training ship and more than meets the cooperation requirements of the federal government, which will furnish the vessel and $25,000 a year for her operation. New York, Massachusetts, and Pennsylvania are maintaining such ships on the Atlantic Coast with good success. The California State Ship will be the first Pacific Coast training vessel.

The Pacific American Steamship Association (John C. Rohlfs, president), the Shipowners' Association of the Pacific Coast (Frank J. O'Connor, president), the C. C. Thomas Naval Post of the American Legion, and the Chambers of Commerce of a number of California ports were all active in sponsoring this legislation.

There now remains for Governor Young the important task of choosing a State Board to cooperate with the State Superintendent of Education in the management and operation of this vessel. Such board should be chosen as will worthily represent the maritime interests of the State of California. It should be composed of practical shipping men who are broad-minded enough to recognize and desire real educational values for this enterprise.

The California nautical training ship is a state-wide institution. Properly managed, it should greatly assist in making the whole California population shipminded. Its graduates will be not alone navigators and marine engineers, but commercial diplomats commending the physical, mental, and spiritual products of California to marts of the seven seas.

Safety of Life at Sea

THE deliberations of the International Conference for Safety of Life at Sea which recently closed in London have brought forth a rather important international convention whose effects will be far-reaching over a long future period.

This convention is arranged under such classifications as: Subdivision, stability, life saving apparatus, wireless installations, and safety of navigation.

Under subdivision and stability there are certain amendments to the rules laid down in 1914. These are highly technical and need not appear here. It is generally recognized that a vessel built strictly to the 1914 rules, properly loaded, and clearing in a seaworthy condition is the safest method of travel known to man.

Under life saving apparatus, the convention insists not only on "boats for all," but also on a reasonable certainty that all boats may be safely launched. Life belts for all and an additional capacity of 25 per cent. in "light buoyant apparatus."

Under wireless installations, the convention makes drastic changes. Henceforth all vessels engaged in international voyages, except freighters under 1600 gross tons, must be equipped with wireless capable of both receiving and transmitting messages at sea. All vessels of 5000 gross tons and over carrying passengers must be equipped with wireless direction finding apparatus.

Under safety of navigation, the convention, recognizing the necessity for an international standard for helm orders, determined that after midnight, June 30, 1931, all helm orders must be given in the direct sense. In other words, an order "starboard your helm" must mean that wheel, rudder blade, and ship will all move to starboard.

The maritime nations of the world owe the delegates to this convention a debt of gratitude for the ability, industry, and spirit manifested in carrying on this great work.

The New President Adams

THE Potrero Works of the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., have been receiving many compliments on the manner in which their huge contract for the hull repairs, additions to passenger accommodations, and reconditioning of the Dollar round-the-world liner President Adams was executed. In workmanship, in dispatch, and in thorough attention to detail, this job was Hundred Per Cent O.K., and illustrates the fact, often proclaimed in the columns of Pacific Marine Review, that this great shipbuilding and repair plant at San Francisco has all the elements necessary to carry on its share of the great future shipbuilding program for the American Merchant Marine and the United States Navy.

Nicaragua Canal Survey

CONSIDERABLE interest has been developed recently in the old proposal to put a canal through from the Atlantic to the Pacific on the Nicaragua route. In this connection we are recently in receipt of the following very interesting information from the San Francisco office of the United States Coast and Geodetic Survey:

Congress has passed a resolution authorizing a survey for a canal through Nicaragua, no definite route having been selected. The route recommended for a Nicaragua Canal in 1901 by the Isthmian Canal Commission extends from Greytown on the east coast along the general trend, and utilizing a part, of the San Juan River to Lake Nicaragua; thence across the Lake and out to the Pacific Coast at Brito. The length of this route is 161 nautical miles. The length of the Panama Canal is 41 miles.

It seems probable that any change that may be made in the route will not affect materially the distance between Pacific and Gulf coast ports via the proposed Nicaragua Canal. Distances via the Panama Canal and the Nicaragua Canal as proposed in 1901 are given in the table herewith. Distances in the first column have been compiled recently in this office; those in the second column are from the Hydrographic Officer's Table of Distances.

All distances from Gulf ports are via Yucatan Channel. Distances to the proposed Nicaragua Canal are close along the east coast of Nicaragua in the channel having a least depth of about 7 fathoms between the coast and the offlying shoals. From Yucatan Channel to Panama there is no saving in distance, and therefore, no object, in using this route and the distances are measured along the deeper water route east of the shoals. To proceed from Gulf ports to the proposed Nicaragua Canal via the route east of the shoals will add about 100 miles to each distance and decrease the saving in distance by the same amount.

From Atlantic coast ports the best route is via Crooked Island and Windward Passages and the saving in distance is less. For ports between Portland, Maine, and Jacksonville, Florida, the saving in distance to San Francisco, via the proposed canal, varies from 340 to 370 miles.

Slight discrepancies in distances result from measuring over slightly different routes.

Distance in nautical miles, San Francisco to:	Via Panama Canal (C. & G.S.)	Via Panama Canal (H.O.)	Via proposed Nicaragua Canal	Saving in Distance via Nicaragua.
Key West, Fla.	4,367	4,353	3,788*	579
Tampa, Fla.	4,520	4,505	3,983*	522
Pensacola, Fla.	4,640	4,632	4,084**	548
Mobile, Ala.	4,675	4,659	4,111**	548
New Orleans, La......	4,688	4,691	4,118**	573
Port Arthur, Tex.....	4,790	---	4,191*	599
Houston, Tex.........	4,846	---	4,247*	599
Galveston, Tex.......	4,809	4,781	4,210*	599
Corpus Christi, Tex..	4,856	-----	4,257*	599

*Measured by Coast Survey; compare two Coast Survey distances for saving in distance.

**Furnished by Hydrographic Office for Isthmian Canal Commission report of 1901; compare two Hydrographic Office distances for saving in distance.

The past six years have demonstrated that home ships build up home trade abroad as no other ships can or will. During these six years the ocean borne foreign trade of the United States has increased as much as it grew during the whole of the preceding half century.

[Edward C. Plummer, U S. Shipping Board.]

Twenty-Five Years Ago

IN July 1904 Pacific Marine Review carried a number of items that are very interesting in retrospect.

Maritime circles in Seattle were all excited at that time in expectation of the United States Merchant Marine Commission, which was to (and did) hold a hearing at Seattle, beginning on the 25th of that month. Pacific Marine Review was therefore full of exhortation to all faithful friends to come forward for the help of the American merchant marine. These paragraphs have a familiar ring:

"Never during the years that the great shipping question has been agitated have Congress and the Nation been wrought to such a pitch. Let us strike while the iron is hot, rather than waste time in academic discussions. . . . The most striking feature of the evidence so far heard before the commission is the unanimity of men in all sections of the country in favor of extending to the merchant marine whatever material protection it needs to offset foreign subsidies and cheap labor and to restore to the American flag the greater proportion of our exports and imports."

Report was made of rapid progress on the battleship Nebraska then building at Moran's Shipyard, Seattle. "There is no doubt that she will be ready for launching in September."

Here is a forward looking statement that unfortunately, is still only a prospect:

"The coastwise shipping laws as they now stand have already insured us a fleet of steamers from Pacific Coast ports to Hawaii and we certainly should feel the permanent benefit when these laws are extended to the Philippines in 1906."

Loose Knots

THE letter reproduced below certainly indicates a point well taken. However, we understand that in "knot lore" all beginners are advised to make their knots loosely until they learn correct usage. Webster allows the use of the term "knots per hour" or "knots an hour" as loose usage. Having now been dubbed "Expert" by our correspondent, we will endeavor henceforth to draw our knots more tightly.

Editor, Pacific Marine Review. Dear Sir:

I was much surprised to see a magazine of the standing of Pacific Marine Review publish an article headed "Knots Per Hour," found on page 179 of the May issue. Such an article could be overlooked if appearing in a newspaper, whose staff, not being familiar with marine terms, could not be expected to know the difference between nautical miles per hour and knots per hour; but the publishers of a marine magazine such as yours certainly should know that the knot is a unit of velocity and means nautical miles per hour. The expression "knots per hour," therefore, means nautical miles per hour per hour. This is evident from the description of where the word came from and method of obtaining the speed in knots given in the second paragraph of this article.

I believe the knot is the only unit of velocity in the English system and when used correctly the speed of a vessel is given as so many knots and **not knots per hour.**

James C. Barnaby, Engineer.

Staten Island, N. Y.

Into the Buddhist Beyond

Miniature Sampan Prepares Way for Six Fishermen of the Daikoku Maru, Lost in Hawaiian Waters

By Andrew Farrell

SIX men composed the crew of the Japanese sampan Daikoku Maru. They sailed to fish in the waters of Necker Island, one of the uninhabited rocks of Northwestern Hawaii; and they did not return when they should. Various craft searched for them; no trace of men or sampan was found. When they were overdue some five weeks, and effort at rescue had been abandoned, "provisional" funerals were held for the six at the home of the master of the Daikoku Maru in Kakaako, Honolulu. In the primary idea there was, perhaps, nothing new: more than one gravestone in a New England churchyard perpetuates the memory of some whale-hunter who did not return from the sea. But New England seldom, if ever, employed such poetry for the dead as did those Japanese of Honolulu; and it is doubtful whether the cold and precise New England mind could experience quite the faith of Japanese Buddhists.

At the home of the missing captain gathered crowds of friends. There were banks of flowers and crude shrines in which candles smoked, and before them some of the visitors kneeled. Others chatted, as though this were no funeral; kimono-clad children darted about after the immemorial fashion of children, who do not permit death to interfere with their play; and here and there a Japanese woman, quite calmly and with no conception of the Occidental meaning of privacy, nursed her infant. Next door a Japanese feast had been prepared. To lament the dead is well enough, but the living must continue to eat, and mourning is a sore trial to the stomach.

With the feast done, a procession formed and proceeded to Kewalo wharf. First marched men dressed in black garments of Occidental—of "European"—style. The leading pair carried paper lanterns, since it is obvious that the way of the dead should be lighted; and others bore long white pennants. A cluster of Buddhist priests glowed like impossible flowers in the bright Hawaiian sun, so brilliant shone their robes; but the women of the party were, for the most part, in somber kimonos—fittingly enough, inasmuch as women must weep, and they tend too much to decoration of the person. For once let them be subdued. Paul (erstwhile Saul) said something to the same effect, though he had sound in mind, and not color.

Near the tail of the procession was an automobile hearse. That seems incongruous, an automobile hearse at a Buddhist ceremony; perhaps no more strange, however, than a pipe organ in a Christian church. What did St. Paul know of pipe organs? In the hearse (made in Detroit) was a miniature sampan, ten feet long or so; and in the sampan were vegetables and fruits, both of which might serve as food; flowers, water, sandals, and especially six toba, or sticks of wood, one for each of the missing men. On one side of each stick was a man's worldly name, by which he was known in life; on the other was his posthumous Buddhist name, by which he will be known in eternity.

Near Kewalo wharf a wall of white and red cloth had been erected, and within the inclosure was a tent of the same colors. Here Buddhist priests, in robes of gold and green and purple, read and chanted and prayed before an altar, heavy with flowers, upon which the tiny sampan had been placed; and other persons recited from eulogistic memorial scrolls. More chanting, strokes on a bell; the name of each missing man was called, whereupon friends and relatives, who had awaited the cue, sprinkled incense at the altar.

Afterward the little sampan was removed from the tent and was carried to the forward deck of the sampan Nagashima Maru, which had searched long and vainly for the missing men; and about the little sampan, ensconced on the larger, wreaths of flowers were placed. Then the Nagashima Maru put to sea, and four miles offshore launched the miniature craft with its cargo of vegetables and fruits, flowers, water, sandals and especially toba, or sticks of wood bearing the names of the dead. From both bows of the Nagashima Maru was poured sake, that deadly Japanese rice wine; wreaths of flowers were cast upon the sea; the northeast trade wind filled the single sail of the little vessel, and it tossed toward the southwest.

If the men, by some improbable chance, still lived, the miniature sampan would find them, ever so infallibly, and would pilot them to Honolulu and to safety and to their homes. If they were dead, the miniature sampan would sail directly into the Buddhist hereafter, which for lack of a better word must be described as the Buddhist paradise, and would prepare for their coming.

Honolulu still awaits the return of the six fishermen.

Our Stake in the Pacific

AS the conclusion of a masterly address delivered before the annual meeting of the United States Chamber of Commerce, Chester H. Rowell thus sums up the opportunities and the responsibilities lying westward from the Golden Gate:

Our stake in the Pacific is in the whole of it — in its peace and progress as well as in its markets; in what it can do for itself as well as what we can get out of it.

There, in the Orient is our opportunity and our risk. There our trade will grow and our investments increase. There many of our sons will make their homes, guiding the expanding industries of a new-old world. There the other half of the human race is to learn from us the lessons we have learned, of science, of machinery, of industry and commerce.

There perhaps, if we are wise, we shall learn of them the equally needed lesson that man is the measure of things, and not things of man. We measure a man's "worth" by his possessions or the market price of his services—by money and goods. They measure the value of things by their service to life. If the machine is to be our servant and not our master, if business is to serve us and not we it, if we are not to be overrun by the juggernaut we have built, perhaps we have as much to learn as to teach.

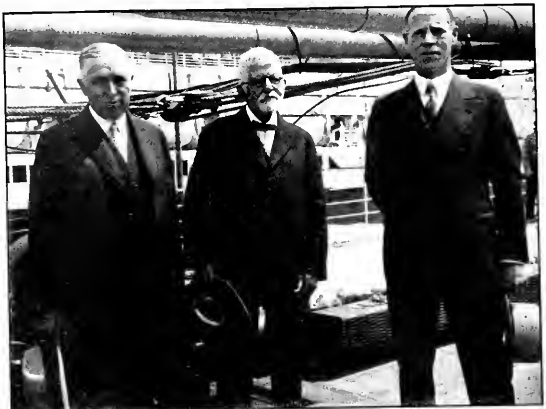
At least we may realize that we have entered on the Pacific Age. Our face is westward, and our stake in the Pacific is our part in the whole future of mankind.

New Inter-Island Steamer Hualalai

Bethlehem Shipbuilding Corporation and Westinghouse Electric & Manufacturing Company Deliver Another Waialeale to the Inter-Island Steam Navigation Company of Honolulu

OVER fifty years of successful operation of steam vessels in the Hawaiian Islands coastwise trade qualifies the Inter-Island Steam Navigation Company to a place in the front rank among the older ship owning companies on the Pacific Ocean. Of the original charter members of this firm only one, G. N. Wilcox, its present president, is still alive. Mr. Wilcox will be ninety years of age in August next and he is still the active executive of a line operating ten freight and passenger steamers, two motorships, one steam tug, one motor tug, and five steel barges. So active is Mr. Wilcox that, accompanied by his secretary, Edward S. Swan, and by A. H. Armitage, general manager of the Inter-Island Steam Navigation Company, he journeyed from Honolulu to San Francisco to accept delivery of the new passenger and cargo steamer Hualalai from the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., and to make the return voyage to Honolulu aboard that ship. We pass the crown to G. N. Wilcox as the oldest active shipowning and operating executive on the Pacific and, for anything we know to the contrary, in the world.

While in San Francisco, Mr. Wilcox, Mr. Swan and Mr. Armitage observed the acceptance trials of the Hualalai and expressed themselves as highly pleased with the results. The Hualalai is an exact duplicate of the Waialeale, built by the same plant and was ordered as a result of the remarkable popularity achieved by the latter steamer in her twelve months of operation.



G. M. Wilcox (center), president of the Inter-Island Steam Navigation Company, Edward S. Swan (left), his private secretary, and A. H. Armitage (right), general manager of the company, at San Francisco to accept delivery of the vessel.

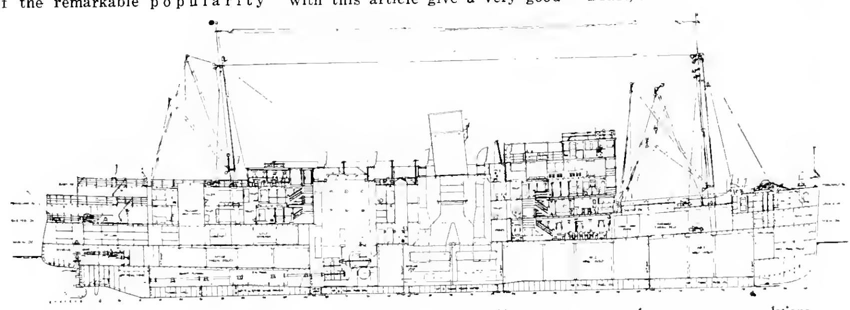
On trials outside the Golden Gate, June 2, the Hualalai was operated at full power over the run from the lightship to Point Reyes and return, a run of 21¾ miles each way. Against wind and sea she made a speed of 15.3 knots; with wind and sea a speed of 16.62 knots; or an average of 15.96 knots. This speed is 0.96 knot faster than contract requirements and at least ½ knot faster than the trials speed of the Waialeale.

The illustrations and drawings with this article give a very good idea of the arrangement, furnishings, and equipment of this vessel, and the following description details the more important items.

General Hull Characteristics

The Hualalai has the following principal characteristics of hull:

Length, over all	310′ 10″
Length, between perpendiculars	295′ 0″
Beam, molded	48′ 0″
Depth, molded to shelter deck	27′ 6″
Draft, forward	17′ 1½″
Draft, aft	17′ 7½″



Inboard profile of Hualalai showing arrangements of boilers, turbines, cargo spaces, and passenger accommodations.

Mean loaded draft	17' 4½"
Displacement, tons	4323
Deadweight capacity, tons	1800
Shaft horsepower	4000
Speed at sea, knots	15
Passenger capacity:	
First class	212
Third class	96
Crew	67
Fuel oil capacity, tons	464
Fresh water capacity, tons	146
Automobile capacity, tons	20
Cargo capacity, tons	1170

She has a cruiser stern and a straight stem raked slightly forward, which, combined with a decided rake aft of masts and funnel and a graceful sheer line, give a very buoyant, lively, graceful appearance. The hull is of the flush two-deck design, with a two-deck steel superstructure and is built to the highest rating of the American Bureau of Shipping. Six watertight bulkheads divide the space between the main deck and the tank top into seven water-tight compartments. Going from the bow aft there are: forepeak tank, cargo hold No. 1, cargo hold No. 2, boiler room, engine room, cargo hold No. 3, afterpeak tank. The double bottom under Nos. 1 and 2 cargo holds and under the engine room is used for fuel oil; while that under the boiler room is used for fresh water.

A novel feature in the hull design provides a large hatch for cargo holds Nos. 1 and 2, and gives good headroom for automobiles in the tween decks forward. The watertight bulkhead between Nos. 1 and 2 holds is located in the center of the hatchway and ample headroom is provided by reducing the main deck sheer to zero from a point about amidships up to the after end of this hatchway and carrying the main deck from that point forward with a sheer parallel to that of the shelter deck. This gives room for a large side port with height enough so that any auto can drive aboard with its top up. It also allows more opportunity for maneuvering sling loads in the hatchway to place them properly in either hold. At the forward end of the automobile garage the line of the shelter deck is dropped, giving ample headroom in the forecastle without undue rise in the forecastle deck and at the same time allowing ample space between shelter deck and main deck at this point for boatswain and carpenter stores.

Passenger Accommodations

The first-class staterooms on the Hualalai are all outside rooms on

Detail of stairway in the dining saloon, featuring Goodyear marbelized rubber tiling.

the promenade and shelter decks. The majority of these rooms are equipped to take care of three passengers, being furnished with two Simmons metal beds and a Simmons Pullman berth. Running water, porcelain wash basin, electric fan, thermos bottle, dressing table, and settee are included in the equipment. A number of the staterooms have private toilets and showers. Stateroom bulkheads are Haskelite and all stateroom interiors are finished in white enamel, with which the mahogany finished metal furniture and dark carpets make a very pleasing contrast.

Practically all ceilings in first class passenger accommodations are in Vehisote and much of this material is used for paneling in the public rooms and corridors.

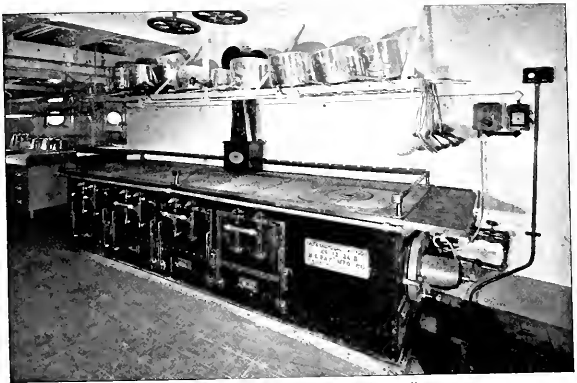
All steel decks in way of passenger accommodations are covered with Linatol furnished by Hill, Hubbell and Company, San Francisco.

Finest quality bed clothes are standard equipment on the steamers of the Inter-Island Steam Navigation Company, and on the Hualalai this equipment includes 100 dozen cotton sheets, 100 dozen cotton pillow slips, and 445 Satin spreads furnished by the Parker Wilder Company of New York. These Satin spreads are especially made for this job by the Monadnock Mills and are decorated with the insignia of the company woven into the center of each spread. The Cannon Mills, Inc. of New York furnished 290 dozen towels, and the Excelsior Quilting Company provided 20 dozen mattress protectors.

The wooden moldings and pilasters in the staterooms, passageways, and public rooms are as nicely fitted a job of joiner work as we have seen on shipboard and are certainly a great credit to the builders.

Public rooms include the dining saloon, social hall, and smoking room; but we can imagine that during Hawaiian inter-island voyages the most popular congregating spaces will be the wide stretches of beautiful teak floor under the awnings on the boat deck. The

A corner in the elegantly furnished first-class lounge, featuring the lavish use of Vehisote paneling.



Ray oil burning range in the first-class galley.

smoking room, furnished in natural teak, is erected on the boat deck, and light refreshments can be served from its counter.

Ample provision is made for ventilation and for insulating the passageways, public rooms, and staterooms from the heat of boiler and engine rooms. The Plant Rubber and Asbestos Company furnished and applied this insulation in the bulkheads between the fire and engine rooms and the quarters surrounding them. This was done so efficiently that none of the waste heat is allowed to escape to the staterooms and passageways. This is a very important factor for insuring comfortable living quarters aboard ship in tropical and semi-tropical climates.

The social hall, finished in white enamel with mahogany trim, is comfortably carpeted and furnished with upholstered wicker chairs and settees, a piano, victrola, and radio. The dining saloon seats a total of 95 persons, mostly at tables seating two and four, with one central table seating eleven. This room is located on the main deck and occupies the full width of the vessel, having attractive windows masking the port holes and a fine mahogany buffet decorated with a carved and colored medallion representing the Hawaiian coat of arms. The floor is laid in marbleized Goodyear rubber tiling in a very pleasing design. This tiling is used also on the stairs in combination with bright monel metal nosings, giving a very rich and permanent floor color scheme.

Monel metal is used profusely on this vessel, particularly in the pantries and galley. The pantry is located immediately aft of the dining saloon on the port side. It is elaborately fitted with steam tables, china and glassware racks, electric griddles, egg boilers, and toasters. Ample service and passage room is provided. In fact the Hualalai's pantry and galley spaces are much more generously proportioned than those on most of the big liners. The galley runs athwartship immediately aft of the pantry. It is equipped with Ray oil-burning ranges.

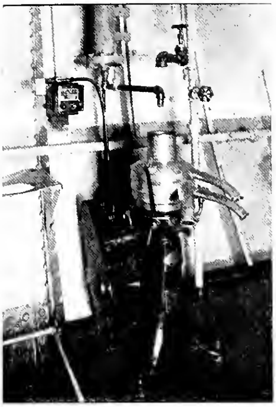
This galley and the pantry adjacent were planned and much of the equipment was supplied by the Dohrmann Hotel Supply Company of San Francisco. Many of the fixtures were built to order to the plans of this firm. In these fixtures, liberal use is made of monel metal. Among other equipment supplied by this firm are: A Hobart super-mixer, Dry-Kold refrigerator, Surgex electrical dishwasher complete with sinks, Wearever aluminum steam-jacketed kettles, a battery of coffee urns, and a Cleveland steam cooker. This firm supplied also the Stanley unbreakable water jugs for the stateroom equipment.

The table linen furnished especially for the Hualalai includes 170 Rosemary Basco damask table cloths and 100 dozen Rosemary Basco linenized cotton napkins furnished by James L. Wilson. Silverware was furnished by the International Silver Company.

Propulsion Machinery

The power plant of the Hualalai is in every particular identical with that furnished by the Westinghouse Electric and Manufacturing Company to her sister ship the Waialeale and consists of two Westinghouse combined impulse-reaction type complete expansion turbines each driving one of the twin screw shafts through Westinghouse double reduction gears. Each of these turbines develops a maximum of 2000 shaft horsepower at a turbine speed of 3600 r.p.m. and a propeller speed of 135 r.p.m. corresponding theoretically to a ship speed of 16 knots per hour. On builder's sea trials outside the Golden Gate the Hualalai made an average speed over the run from Point Reyes to the lightship and return of 15.96 knots.

First class pantry. Note liberal provision for mechanical ventilation and handy arrangement of steam tables. The pantry and galley arrangement was planned and the equipment largely supplied by the Dohrmann Hotel Supply Company of San Francisco.

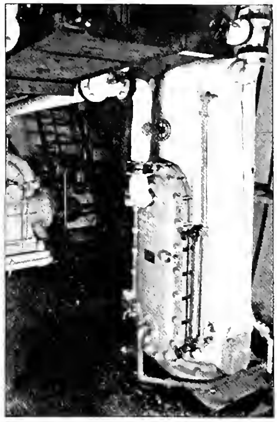

For purifying lubricating oil, a De Laval centrifugal separator is installed.

This propulsion equipment for the Hualalai was built in accordance with the rules of the United States Steamboat Inspection Service and the requirements of the American Bureau of Shipping. The turbines are designed to operate with 265 pounds gauge pressure and 75 degrees Fahrenheit superheat at high pressure ahead and astern nozzles. Connections are provided on the turbine casing for admitting excess exhaust steam from the auxiliaries. At light load the auxiliary exhaust will be admitted in the impulse chamber and at full load about midway of the reaction blading. A constant pressure valve automatically admits to the turbine auxiliary steam not used in the feed water heater. An oil relay closes this valve if the turbine overspeeds. While maneuvering it is closed by opening a three-way valve at the maneuvering stand.

The ahead nozzles of the turbines are arranged to produce the most efficient operation of the ship at the different speeds, each turbine being equipped with two ahead nozzles either or both of which may be open. The smaller nozzle is designed to develop 350 shaft horsepower with a turbine speed of 2270 revolutions per minute. The larger nozzle is designed for 1600 shaft horsepower with a turbine speed of 3440 revolutions per minute. With both nozzles open each turbine will develop 2000 shaft horsepower with a turbine speed of 3600 revolutions per minute.

A reversing element is located in the main exhaust chamber and consists of a two-row impulse wheel very similar to the ahead impulse element. This astern turbine is capable of transmitting 60 per cent of the full speed ahead power with full speed ahead steam flow.

The reaction element consists of


The Western Engineering Company, San Francisco, supplied this Davis Paracoil evaporator.

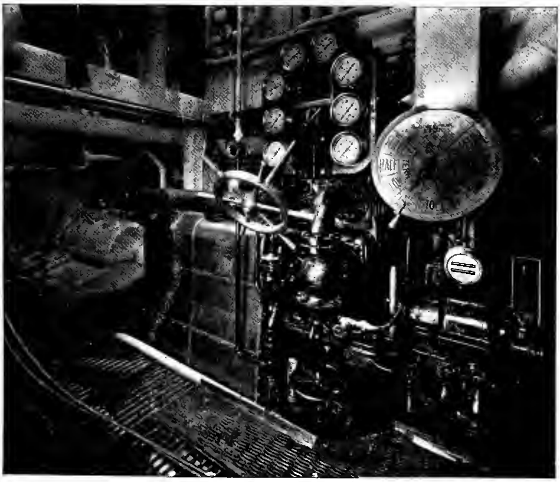
21 pairs of rows. The rotor is cylindrical in shape while the cylinder is conically bored. This provides a gradually increasing area producing the most efficient passage for the steam. The rotating reaction blades are of nickel and the stationary reaction blades of manganese bronze.

Each double reduction gear is built in a single case and the gears are arranged in a nearly vertical plane in order that the turbine might be located high enough above the ship's bottom to permit installation of the condenser underneath.

A propeller thrust bearing of Kingsbury leveling block type is mounted on the main gear shaft at the forward end. It is contained in a housing which is an integral part of the main gear housing.

Main condensers are of the Westinghouse two pass type each having 3150 square feet of cooling surface. They are cylindrical in shape and constructed with cast iron shells, Muntz metal tube plates, and Admiralty metal tubes. The condensers are suspended from the top and serve as a support for the main turbines.

Cooling water is supplied by two 14-inch centrifugal pumps each having a capacity of 5200 gallons per minute and each driven by a 50-horsepower geared turbine. A vertical motor driven condensate pump removes the condensed steam from each condenser. The air removal unit consists of two West-

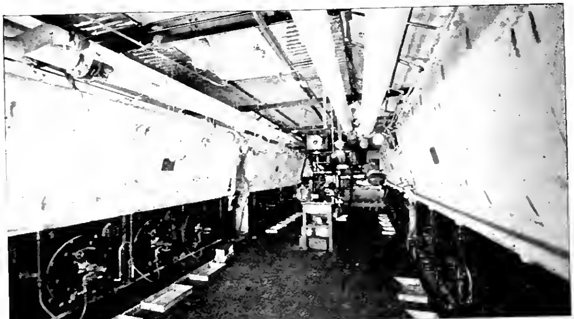

The control stand in the engine room showing the controls for the port side Westinghouse main propulsion turbine and the receiving dial of the port side Cory engine room telegraph.

inghouse multi-stage, high efficiency, condensing type air ejectors, mounted on a common intermediate and after condenser of the surface type.

Auxiliary Power

To take care of the auxiliary lighting and power load on this vessel two Westinghouse 75-kilowatt, 125-volt, direct-current steam turbine geared generating sets are installed. The operating conditions are 265 pounds steam pressure, 75 degrees Fahrenheit superheat, and 12 pounds gauge back pressure. The turbine will operate at 8400 revolutions per minute and the generator at 1200 revolutions per minute. These geared turbine generator sets are the last word in design and it is rather misleading to refer to this type of turbine generator as a geared set, because the usual impression of the geared turbine generator unit is one of a unit consisting of a turbine having its own bearings, coupled to a gear unit having four bearings and a generator. This means a set having eight bearings. The new turbine generator unit has only five bearings.

On these new units there are a number of outstanding new features. These include: overhung turbine rotor, oil governor, restraining rings, new lubricating system, external oil cooler, duplex strainer, auxiliary steam driven oil pump, and the absence of flexible couplings. In addition to these new features the Westinghouse Electric Company engineers included in these new turbines some of the well-tried and reliable features of their previous designs among which may be mentioned the single impulse wheel, water sealed spindle gland, emergency overspeed governor, and a hand speed changer.



The four Babcock & Wilcox water-tube boilers whose furnace fronts are here shown furnish steam for the Hualalai's machinery. Note in the center the Tycos stack temperature recorder.

Ilg blower on the boat deck.

Steam Generating Plant

Steam is generated in four Babcock & Wilcox marine water-tube boilers with superimposed superheaters. Each boiler has 3067 square feet of heating surface, giving a combined total heating surface of 12,268 square feet for the four boilers. They were built for a working pressure of 280 pounds per square inch and a superheat of 75 degrees Fahrenheit. The furnaces were arranged for oil fuel, and each boiler is equipped with four Babcock & Wilcox mechanical oil burners of the Cuyama design. A special double furnace front construction is used to provide for either natural or assisted draft. Each boiler is served by an electric-motor driven blower built by the Western Blower Company of Seattle. The blowers are located at the rear of the boilers and the air is led through ducts under each boiler to the double furnace front. Each boiler is fitted with Diamond Power Specialty Company Model G-2 marine type soot blowers.

Fuel oil is transferred from the various bunkers to the service tanks by a Warren 10 by 7 by 12-inch vertical duplex piston pump, supplied by the Western Engineering Company. Service fuel oil to the burners is provided by two pumps. One of these is an electrically driven Quimby screw type pump capable of delivering 15 gallons of fuel oil per minute against a pressure of 200 pounds per square inch and driven through a Fast flexible coupling by a Westinghouse 7½-horsepower, 850-revolutions per minute, S.K. type, shunt wound, enclosed, self-ventilated motor. The other oil service pump is a steam driven Warren 5¾ by 4 by 8-inch vertical duplex type.

Feed water is handled by two Warren 12 by 9 by 24 vertical, simplex steam pumps. There is one Davis improved Paracoil closed type feed water heater, with a capacity for raising 55,000 pounds of water per hour from 83 to 230 degrees with steam at 12 pounds back pressure. This heater is built with a cast iron shell and headers and with copper coils. The coils and headers are designed for 350 pounds working pressure. Air is removed from the feed water by a No. 35, cast steel Hickman air separator having a capacity of 55,000 pounds of feed water an hour and suitable for a working pressure of 350 pounds.

Make-up feed water and fresh water for various purposes are insured by the installation of a Davis Paracoil evaporator and a Davis Paracoil distiller. With steam on the evaporator at 125 pounds it has a capacity of 10 tons of sea water every twenty-hour hours. The distiller has a capacity to deliver 10 tons of fresh water every twenty-four hours. All parts of the distiller in contact with fresh water are heavily tinned to prevent contamination. All of the Warren and the Quimby pumps, the Hickman air separator, and the Davis heat transfer apparatus were supplied by the Western Engineering Company of San Francisco.

Pneumatic tank gauges, conveniently located, indicate to the engineer the condition of his oil and water tanks. Tycos stack temperature indicators and Ranarex carbon dioxide indicators keep a careful check on combustion. The Chevalier Drainator steam trap is used on steam lines.

For keeping the lubricating oil in good condition for the gears and bearings on this plant, the Western Engineering Company furnished two Davis Paracoil lubricating oil coolers, each of which is capable of reducing from 110 to 100 degrees Fahrenheit the temperature of 200 gallons of Calol extra heavy turbine oil every minute when supplied with 400 gallons per minute of sea water at 80 degrees Fahrenheit. The De Laval-Pacific Company of San Francisco furnished a De Laval centrifugal oil purifier to purge the lubricating oil of all moisture, grit, or dirt.

Ventilation

In a semi-tropical climate like that of Hawaii, an abundance of cool, fresh air is necessary for comfort. And so in designing the Hualalai great care was taken to make her natural ventilation as effective as possible and, in addition, a complete ventilating system has been provided for this vessel in accordance with the latest and most modern practice on vessels for the Hawaiian Islands and South Pacific waters. Every compartment of the vessel, including passenger spaces, galley, pantries, storerooms, holds, machinery spaces, boiler rooms, shaft alley, has been properly and efficiently ventilated with mechanical exhaust and supply ventilation. In this connection the Western Engineering Company furnished the Hualalai with a number of Ilg electric direct-connected blowers.

The principal spaces served by Ilg blowers operating as supply blowers are the main dining saloon, galley, and steerage quarters. The passages and toilets forward, passages and toilets aft are served by Ilg blowers operating as exhausters.

In a number of instances the blowers with direct - connected motors are located on deck and are subject to the elements. Under these conditions the motors are made water-tight with non-corrosive fittings and with speed regulating rheostats enclosed in protected housings.

All cabin staterooms on the Hualalai feature Simmons comfortable beds. This view shows a first-class room, with the Simmons Pullman berth folded up against the bulkhead.

Each stateroom is fitted with a Westinghouse marine type fan. Two Vulcan refrigerating units supply ample cold storage for steward's stores and abundance of ice water for passengers, as well as thirty tons capacity refrigerator cargo space.

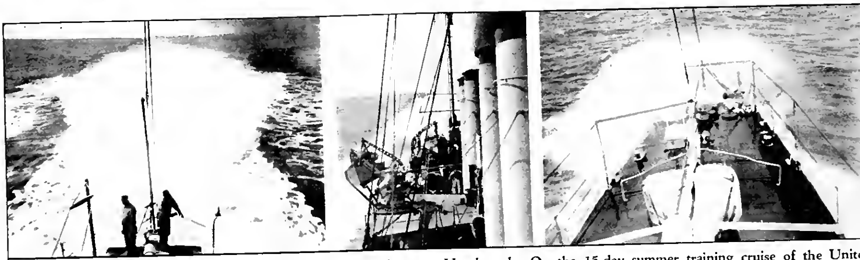
Navigation and Safety Equipment

The bridge of the Hualalai is fitted with all the modern aids to navigation required in a vessel of her type and service. This equipment includes: Three Lietz standard compasses and one Lietz electric sounding machine; two Cory-Kent clear-vision screens, Cory engine room telegraphs, and Cory anti-noise telephone; Sperry revolution indicator; Plant Mills direction indicator; and Walkers patent log.

The steering gear was supplied by the Hyde Windlass Company. This steering gear is of the standard right and left hand screw type, with connecting links to rudder crosshead. The screw gear is supported in heavy pedestals with guide rods to relieve bending action on the screw. The engine is located immediately forward of screw gear with flexible coupling between engine and screw shaft. The engine is a double cylinder, 9 by 9 inches, of the spur geared type, provided with automatic follow-up mechanism. Hand steering is also provided by means of two large 6-foot diameter mahogany steering wheels. Automatic follow-up mechanism of steering gear is controlled by means of the Brown type hydraulic telemotors. The transmitter of this telemotor is located at the steering wheel in the pilot house. The receiver is arranged aft adjacent to the steering engine.

(Continued on Page 29, Blue Form)

The Rich smoke detection and Derby fire alarm cabinets on the after bulkhead of the pilot house.



Three snaps taken on board United States torpedo boat destroyer Hazelwood. On the 15-day summer training cruise of the United States Naval Reserve, Sixth Fleet Division and First Communication Section.

The United States Naval Reserve

By Ensign G. Stephen Perkins, U.S.N.R.

"THE American people want, and in the long run will have, the kind of a navy and merchant marine which seem best to meet their needs. The future of the navy and the merchant marine, therefore, depends upon how clearly the American people can be made to see the need for them, and the place they fill, in peace as well as in war.

Recognition of that need does not by any means imply a spirit of aggression. That the American people will ever engage in a war of aggression is now unthinkable, whatever size the navy and merchant marine may attain. War, even for defense, seems now remote.

The navy's mission, therefore, lies not so much in readiness to resist atack, even though such readiness is vital to efficiency, as in the maintenance of peace.

A navy equal to the best navy of any other country is not only a balance of power, but a balance for peace. A merchant marine necessary for the transportation of our ocean-borne products is also a legitimate aspiration of the American people."

(Proceedings, U.S. Naval Institute.)

It was with the fulfillment of this mission in mind that the United States Naval Reserve was created. The close of the last war found some 550,000 men and officers on active duty with the naval forces. At the present time our sea force is cut to about 5 per cent. of its war-time requirements. In order to provide this tremendous increase in personnel under emergency requirements, the Naval Reserve is maintained. The Reserve does not, however, even approximate the total number of men required. Specialists, a staff, and a limited number of line officers are procured and maintained through the various Reserve organizations scattered throughout the United States. These units are composed of a number of ex-service officers and men interspersed with the younger men who were not of age for active duty during the late war. They are in all cases volunteers and are a true sample of red-blooded Americans. The average age of the enlisted personnel is in the early twenties. These men come from good families and practically all have had at least a high school education. The average reservist, therefore, is of a high moral standard, good education, and is moved by the forces of patriotism which come from his heart. He is not in the reserve because of monetary reasons for the compensation is indeed small in comparison to his civil pay. He is neither forced to enlist nor forced to remain; he is there because of his desire to prepare himself for whatever emergency may arise.

Lifeboat drill with United States Naval Reserve crew on torpedo boat destroyer Hazelwood.

Communication Branch

For the purposes of administration and training the reserve is sub-divided into various classifications. For instance, we have the Communication Reserve for all radio, visual, and sound communication. This organization provides the means for the training of communication officers, radio-men, and signal-men. The communication personnel are trained in the procedure in use by the navy and are made familiar with the various equipment necessary to provide and maintain communication.

In time of war these men would be available for immediate service, operating naval ship or shore radio stations, duties on the signal bridge or any other location where the services of a trained radio or signalman may be required.

Fleet Division

Another very important branch is the Fleet Division. This unit is made up of the various specialists required to man a modern destroyer. The Fleet Division is an intact command whose officers and men would

Naval Reserve crew on the Hazelwood, prize-winning gun crew, and officers of the Sixth Fleet Division. Left to right, these officers are: Lieut. H. F. Nissen, engineering officer; Lieut.-Comdr. L. M. Edelman, commanding officer; Ensign Horace Breed, watch officer; Lieut. F. S. Harris, executive officer; Lieut. L. W. Archer, navigator; Lieut. S. M. Williams, supply corps; Ensign A. A. Charlson, assistant engineering officer; Lieut. Albert Boles, surgeon; Lieut.-Comdr. P. D. Allen, communication officer.

likely all be ordered out on the same ship. These destroyer crews maintain their efficiency through weekly drills held in their own armories, Sunday and week-end cruises and a fifteen-day training cruise in summer. Their duty afloat calls for assignment on board destroyers and other naval auxiliaries, and the drills and exercises performed by them are under the supervision of regular naval officers assigned to that duty. During the summer cruise all stations of the ship are manned by reservists and they perform their duties just as though they were making the navy a career. They are held responsible for the proper observance of all naval regulations and customs and are constantly trained in all emergency drills, gunnery, navigation and engineering.

The Naval Reserve also provides for the training of officers of the staff, such as doctors, dentists, lawyers, naval architects, and supply officers. These officers receive their training through occasional cruises, correspondence, and in some cases weekly meetings. Staff officers at the present time do not receive any retainer pay and volunteer for whatever duty they may elect to perform.

Aviation Branch

Naval Reserve Aviation is a comparatively new activity of the reserve. Officers and men are assigned to local bases for weekly instruction and, like the fleet divisions, they maintain efficiency through periods of active duty on week-ends. In the summer, fifteen day training period aviation personnel are ordered to the nearest naval air base for active training duty and thereby take part in actual fight maneuvers.

The Naval Reserve Officer Training Corps, units of which are maintained at several universities and colleges, serve to train a limited number of college men for reserve commissions. The training of these men is under the direction of a staff of hand-picked officers of the navy assisted by a number of chief petty officers as instructors. A full four-year course embracing practically all of the subjects and requirements of the Naval Academy is given the men enrolled in these units. Upon graduation the successful men are commissioned in the Naval Reserve.

Merchant Naval Reserve

The Merchant Marine Naval Reserve is one of the most rapidly developing branches of the Naval Reserve. In this branch the active, able-bodied officers of the United States Merchant Marine are enrolled for war-time duty. They are given commissions commensurate with their rank on board ship.

Officers in this branch receive texts and courses preparing them for their probable war-time duties. Through this contact with the navy, the Merchant Marine Reservist is kept in touch with the naval view point and is better prepared to visualize the position of the merchant marine under war conditions. The Merchant Marine Reservist has some advantages over the other branches of the reserve. In the first place he is constantly practicing and advancing in his profession, which obviously keeps him better trained in the subjects included under ship operation. He needs only the training of the naval personnel, which he grasps very rapidly because of his direct contact with his ship. Through the various study courses and data available to him he is able to become more proficient in the performance of his professional duties. The engineering branch of the merchant service might profit by the engineering economies effected through years of research as developed by the navy.

Organizational Training

A principle followed in all classes of the reserve is that of training organizations, not individuals. It is a simple matter in peace time to list a number of officers and men, but to give both peace-time training and to provide war-time efficiency it is necessary that individuals be grouped into organizations, and the closer and firmer these organizations are cemented during peace-time the more effective they will be under the strain of war. In the merchant marine, by taking the ship as a unit and commissioning the master and other officers in the reserve, there is provided a living, operating organization already formed which would be of great potential war value.

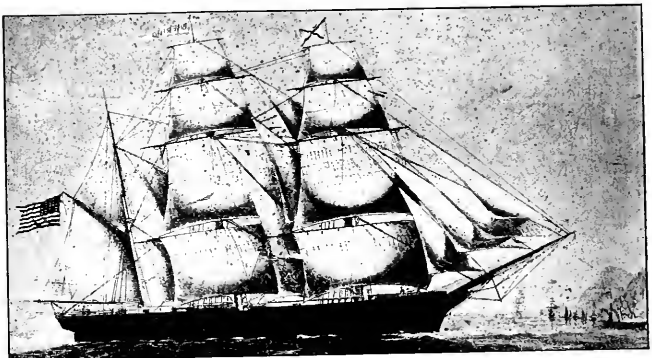
If the ship should be chartered by the navy and operated by a merchant crew, the officers would not be called to active service but, due to their naval reserve experience, would be able to operate with the fleet more effectively. If the vessel on which they were serving should be commissioned and manned by the Navy they would remain on board and constitute the nucleus of its officer personnel.

The Naval Reservist must maintain the efficiency of his rank or rating. He accomplishes this through training received in drill and on his summer cruise each year. In addition to this instruction, he has at his disposal a long list of special correspondence training courses in which he may enroll. The reservist is also in contact with officers and men of the fleet through whom he may gain considerable knowledge.

The Bark Behring

An Old Time Siberian Trader With a Fine Sailing Record

By F. C. Matthews



The American bark Behring (or Bhering) from a Chinese painting made seventy-five years ago. Reproduced through the courtesy of N. H. Hiller of Carbondale, Pennsylvania. In 1872, Mr. Hiller, then four years old, voyaged with his father and mother on the Behring from the Amoor River to Vladivostok and Shanghai. Note the spelling of the name on the burgee. Shipping registers prior to 1872 agree with that spelling. Subsequently, the name appears as Behring.

THE sailing ship Behring (or Bhering) was built by J. T. Foster at Medford, Massachusetts, in 1850 for W. H. Boardman, Jr., of Boston. Mr. Boardman's firm was prominent as merchants and shipowners and included in their diversified operations were ventures in the Northwest fur trade which were continued until the activities of the Hudson's Bay Company caused the business to become unprofitable to private firms. The attention of the Boardman house was then turned towards the Siberian coast, and for many years a vessel under its house flag regularly visited that inhospitable region. Stops were made at Honolulu on outward and homeward passages with, at times, a call at the Japanese port of Hakodate. The Behring, especially built for this trade, was appropriately named for the Danish navigator Vitus Behring who, in the interest of the Russian Government, spent some fourteen years in exploring both shores of the Pacific Ocean in high latitudes and after whom were named a sea, a strait, and an island. On this desolate island, one of the Aleutian group, Captain Behring was shipwrecked in 1741 and there shortly thereafter died.

The Behring was a handsome vessel of only 280 tons burden and drew but 13 feet of water when fully loaded. She was modeled for fast sailing and some of her passages compare favorably with those of full rigged clipper ships of many times her size. In 1852-1853 she was 113 days from Boston to Honolulu—thence 24 days to Petropaulsky—18 days in return to Honolulu, and 90 days thence to New London. In 1866 she made several round voyages between Honolulu and San Francisco in good time; thereafter going to New York in a short run of 112 days from the Golden Gate. In 1873 her homeward passage was from Manila to New York, 117 days.

Three of the best known masters of the Behring were Captains H. G. Morse, G. Oscar Lane, and E. H. Burr. In 1854 she was diverted from her regular run to make a voyage to the Mediterranean, and the following account, abridged from some published reminiscences of her then master, Captain Morse, later of the clipper ship Polynesia, relates incidents leading to, and particulars of the voyage.

Voyage to the Mediterranean

In 1853, after arrival of the Behring at Honolulu from Boston, I was promoted from mate to master, following the death of the captain. From Honolulu we sailed to Petropaulsky in 24 days and, after discharging cargo, loaded some salt salmon and green birch cordwood for Honolulu. Made the run down in 18 days. Then loaded oil and bone from the catch of the whaling fleet and was 90 days, 2 hours to New London. This was a remarkably fast passage, gratifying to both myself and my owner; but certain operators of Boston clipper barks seemed to think it was a freak run and expressed the opinion that our little vessel would be no match for such of their famous flyers as the Wildfire, Race Horse, or Newsboy, operating in the fresh fruit trade with Mediterranean ports. Mr. Boardman decided to have a try out on such a voyage and offered to back his bark in any amount to outsail their clippers, all of which were considerably larger than the Behring. After some bantering Mr. Goddard offered to wager a pair of gloves on the bark Race Horse and she sailed from Boston, April 4, 1854.

The Behring was not to go direct but by way of Havana and I sailed from New London May 15. On being dropped by the tug off Montauk Point, it was found that the crew which had come on from New York were wholly incapacitated through excessive drinking, and my two mates, assisted by the cook and steward, managed to get the topsails set and, the following day, the courses and topgallants. With a fair wind and a smooth sea we were now able to get along at 10½ knots. By this time some of the men wanted to turn to but I thought that another day without their eating and to "please me" would make them remember it better, which proved to be the case and we had no further trouble. We arrived at Havana when 7 days out and later loaded a cargo of sugar for Gibraltar for orders. Running across in 19 days we arrived 10 days in advance of our orders, which, when finally received, instructed us to proceed to Trieste for discharge. At Gibraltar we heard that the Race Horse had come across in 17 days from Boston, a fine run but not equal to that of the Behring considering the extra distance we had covered.

When the cargo was discharged at Trieste and I was uncertain about our next move, it was accidentally learned that a parcel of 400 tons of cargo was at Malaga ready for immediate shipment to the United States. I cleared and sailed that same day and reached Malaga in time to secure and load the freight, sailing after but a short detention.

A Close Call From Shipwreck at Gibraltar

Arriving at Gibraltar at 7 a.m. December 30, 1854, we found the wind dead ahead, blowing strong, and came to anchor in 3 fathoms preparatory to loading 50 tons of pig lead as specified in the charter party under such conditions of wind and weather. One lighter load of 20 tons had been received and taken aboard, when warnings of an approaching gale from southwest necessitated moving our vessel into deeper water and this was done at once, just before the gale broke. We brought up in 10 fathoms, both anchors down, with 50 fathoms chain to each; royal and topgallant yards on deck. The gale became a hurricane. At 2 p.m. we parted the starboard chain close to the anchor and commenced to drag. Having in view a quick passage home, I had shipped at Trieste a third mate and 6 extra men, now having a complement of 21 hands all told, not too many, as was soon manifest. We now hove in the starboard chain, attached it to the port chain which had been paid out to the 90 fathom shackle, and, with the 140 fathoms on the one anchor, the Behring was brought up for the time being.

Our troubles were not over, however, by any means. The loss of weight forward, due to the anchors and chains being overboard, caused the vessel's bows to lift so high that her flat floor was exposed to the heavy seas which were sending her astern with great force. To remedy this dangerous condition the 20 tons of pig lead and the water casks were moved forward well up into her eyes, causing the bows to be buried by the seas but lifting the stern so that the swells ran free without setting her back. This expedient was successful and soon we were lying with a slack chain and so rode the night out. At daylight the beach was seen strewn with wreckage from 10 of the 13 vessels that had been at anchor when the storm came on. I signalled to the shore for an anchor and chain which were sent out in a boat shaped not unlike a triangular harrow, very wide at the stern and sharp forward, 50 men pulling the oars. As the gale subsided we finished loading and at 8 o'clock in the evening were under weigh with everything aloft.

Remarkable Homeward Run In Heavy Weather

The first two days out we had strong westerly winds; rigged preventer backstays, fore and main. On the third day washed out the galley, stove bulwarks, split the foresail, and carried away the jib stay. Cleared out space in the cabin to repair sails. Anchors off from the bow and decks flooded. Sighted a bark hove to. Split maintopsail; sent it down and bent another in its place. Decks knee deep in water at times. Brought the halyards aft on quarter-deck. Rigged a hammock for myself on the quarter-deck, stretching a rope above, covering it with a tarpaulin, thus making a tent to sleep in. Blew the jib clean from the bolt ropes; bent a new one. Passed several vessels hove to, all being under close reefs. Snow, hail, and heavy winds from N.N.W. to S.S.W. Arrived off Boston Light on the 19th day with maintopsail, foresail, jib, and spanker the only sails left out of three suits and they had been constantly repaired. Had no galley, no bulwarks, and all hands ready to jump on shore. A tugboat took us to India Wharf. We found that the clipper bark Melita which had left Gibraltar two weeks before us and escaped the heavy weather, had made the passage in 29 days. Others, including fruiters, were from 32 to 42 days to Boston, while those bound to New York were from 40 to 60 days. The little Behring had made good.

Sold To Foreign Flag

In November 1874 the Behring arrived at San Francisco under command of Captain Wessels, 23 days from Petropaulsky with furs consigned to Williams, Blanchard & Co. She then went to Port Madison and loaded a cargo of lumber for Melbourne on owner's account. After arrival out she was sold to go under the British flag, the price reported being 2800 pounds Sterling. She is said to have ended her days as a whaler, out of Sydney.

Public Health Service for Seamen

THE work of furnishing medical and surgical relief to sick and disabled American merchant seamen was begun by the federal government in 1798, and the history of the seaman as a patient of the Public Health Service is a record of the progress of medicine and sanitation in the United States. It was not until 1881 that the Public Health Service first prepared a medical handbook for use aboard ship. This book, "The Ship's Medicine Chest," has been revised from time to time and the latest 1929 edition is just off the press.

While necessarily a very abridged medical treatise, nevertheless, there is compressed into the 200 pages of The Ship's Medicine Chest a vast amount of very useful health information; and in the hands of intelligent seamen and ship officers it should prove invaluable as a guide in many emergencies at sea.

"The object of this book," as stated in the preface, "is to teach officers and crews of American merchant vessels how to preserve their health and to meet intelligently the accidents of disease and injury." This object is well met insofar as the book is concerned by eight chapters and an appendix covering the following subject: Structure and functions of the human body; Hygiene and sanitation on shipboard; Ship's medicine chest and equipment; Medical first-aid; Specific diseases; Surgical conditions; Emergency reference; Radio medical advice; Regulations concerning beneficiaries of United States Public Health Service; List of Marine Hospitals; Care and disposal of dead; Glossary; Index; and Maritime law on crew accommodations and water supply.

H. S. Cumming, surgeon general of the United States, desires us to publish the information that any master of a documented American merchant vessel may obtain a copy of this book free of charge on written request to the Surgeon General, Washington, D.C.

Shipping Board Mileage

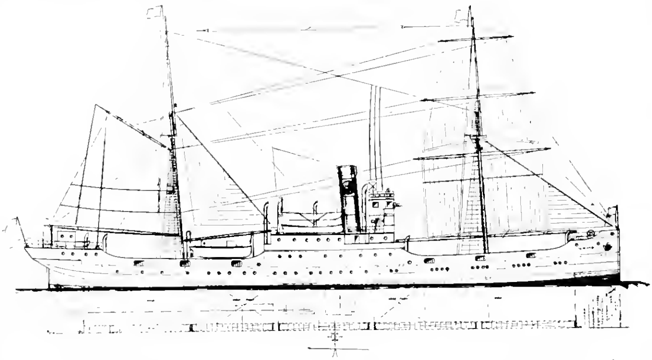
DURING the calendar year 1928 vessels of the United States Shipping Board traveled more than 12,128,000 miles.

The freight vessels, operating to all parts of the world, traveled 11,202,809 miles. The passenger vessels, limited in number, in their transatlantic run totaled 817,217 miles, and the few tankers operated during the course of the year added another 108,941 miles.

The travels of all the Board vessels were equivalent to one vessel circling the globe over 485 times.

California School Ship

Shipowners' Proposal for Conversion of Shipping Board Vessel to be Used as Nautical Training School



Outboard profile of Lake-type Shipping Board freighter showing proposed sail plan rigged as schooner brig. We suggest the name State of California for this ship.

THE California State Legislature having passed an act appropriating monies for the establishment of a California nautical training vessel, we are herewith presenting the plans recommended for such vessel by the Pacific American Steamship Association.

These plans contemplate the conversion of a so-called "lake" type Shipping Board freighter into a school ship to serve the State of California. The lake type is a thoroughly seaworthy vessel. Sturdy, deep-waisted, two-deck, three-island style, with oil-burning, return tubular Scotch marine boilers and triple expansion reciprocating engines, it is a type admirably suited for leisurely cruising as a school ship.

The principal characteristics of this type of vessel are as follows:

Length between perpendiculars	253'6"
Beam	43'8"
Depth	28'4"
Tonnage, deadweight	4200
Tonnage, gross	2674 to 2730
Tonnage, net	1658 to 1693
Normal sea speed, knots (approx.)	9.5
Number of boilers, Scotch	2
Boiler pressure, pounds	185-190
Boiler heating surface, square feet	4720-4876

Engine, one triple expansion; 1450 indicated horsepower; 21 x 35 x 59 inches by 42-inch stroke.

In the conversion plans, it is proposed to provide comfortable berthing arrangements, mess room and study rooms for 120 cadets. The berthing arrangements are to consist of permanent pipe berths, two high, similar to standard merchant ship practice. For each cadet a full length metal locker is to be provided for the storage of clothing, and a sea chest is to be provided under each berth for the storage of other personal effects. These berths and lockers will be in the tween decks forward and will occupy that entire space from the forepeak collision bulkhead to the forward end of the engine and boiler casing.

Immediately aft of this space on the starboard side is the cadet lavatory, a convenient arrangement which permits the engine department cadets coming off duty to wash up before tramping through the sleeping accommodation space.

On the port side, abreast of the engine room casing on this deck, is fitted a well-equipped machine shop. After the engine room casing are two large class rooms, and aft of these class rooms the after tween deck space is devoted to boatswain and sail maker shop.

The cadets' mess accommodations are located in the superstructure on the upper deck. In this space permanent tables are installed with portable benches, and it is figured that between meals this space will serve as a study hall. The entire complement of cadets may be accommodated at one sitting.

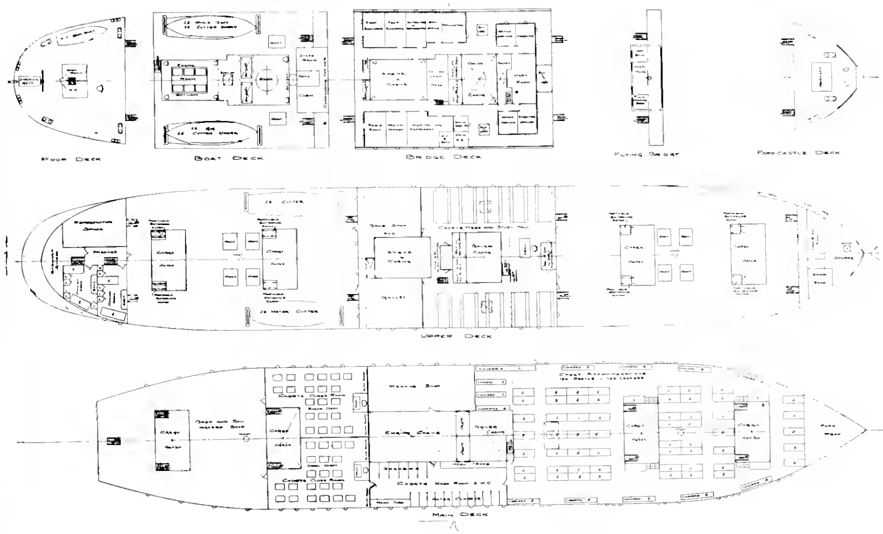
Aft of the mess room and study hall, in the port and starboard spaces abreast of the engine room casing, the galley and bake shop are arranged, separated from the cadets' mess by a wire mesh bulkhead. This arrangement makes for convenience in service to the cadets' mess as well as to the ward room and civilian crew's mess located on the bridge deck directly above.

Ample accommodations are provided in the existing officers' staterooms for civilian crew officers and instructors.

It is proposed to fit the vessel with two masts rigged schooner brig, with square sails on the foremast and fore and aft sails on the main mast. This type of rig will allow instructions and practice with every type of sail used on modern vessels. The existing arrangements of the cargo booms, winches, and other cargo handling gear will be retained to a large extent in order that instructions and practice may be given in cargo handling and stowage.

The plans indicate an ample equipment of boats both for instruction and for safety purposes. As shown on the plans, the boats will accommodate approximately 150 persons on each side of the vessel. The boats will be of wood, similar to the Navy standards for this type of craft. It has been demonstrated that wooden boats of this type are much more practical for the severe abuse they are apt to receive in handling for frequent practice trials.

The existing inner bottom tanks for fuel on this type of vessel give a bunker capacity of 3165 barrels, which figures a cruising radius of about 5236 knots. If desirable, deep tanks may be easily fitted to give approxi-



General arrangement deck plans for proposed California school ship.

mately 8120 barrels under which conditions the vessel would have sufficient fuel for 70 days steaming, sufficient for the round trip to Australia.

The purpose of the whole movement to obtain a school ship for the State of California is to train cadets for future usefulness as officers in the American merchant marine, with particular reference to that merchant marine on the Pacific Coast. The movement is statewide, and the opportunity for nautical training in this school ship will be open to all California boys. While it is natural at the present writing that this school ship should have its home port at San Francisco, because San Francisco is the chief home port for ships and for shipowners on the Pacific Ocean, it should always be borne in mind that this school belongs to the State and its opportunities and its training must be open to candidates throughout the length and breadth of the state, not only from the ports of our thousand miles of coast line, but also from the inland counties.

World's Most Powerful Tug

IT IS always a matter of discussion among marine engineers as to which ocean going tug can claim to be the most powerful. The latest aspirant to that position is a product of the British shipbuilding yard of Sir W. C. Armstrong, Whitworth & Co., named the Sir William Hoy. This tug is for salvage and long sea towing service of the South African Railway and Harbor Administration, with headquarters at Cape Town.

Her length is 180 feet; molded beam, 34 feet 6 inches; molded depth, 17 feet 6 inches.

Of all steel construction, her steel decks are sheathed with teak. The hull is divided into eight water-tight compartments by seven water-tight bulkheads.

The propulsion machinery consists of four Babcock & Wilcox, coal-fired, water-tube boilers with a total heating surface of 10,160 square feet and a total fire grate area of 320 square feet, working at a pressure of 210 pounds per square inch. Babcock & Wilcox patent automatic feed water regulators, feed water filter, and treatment tank, lime tank, and air separator are fitted as boiler room auxiliaries. These boilers supply steam to a pair of triple expansion engines driving twin screws, the engines being 19 x 31 x 51 x 36 inches.

These engines, at 110 revolutions a minute, develop 3500 indicated horsepower and drive the tug at a speed of 13 knots. Michel patent thrust blocks are fitted, and Vickers stern tube glands. All the auxiliary machinery is independently driven. The fire pump is capable of discharging 1500 gallons per minute and of throwing a 2 1/8 inch jet to a height of 200 feet. A salvage pump is installed capable of discharging 700 tons of water per hour either from the sea to a deck connection for flooding vessels on fire, or from a flooded compartment in a vessel overboard to the sea.

The Sir William Hoy was delivered at Cape Town about the first of May.

"Accidents Will Happen"

ALL we need to do to disprove the piece of ancient cynicism, "Accidents will happen," is to put in evidence the control that we already have won over accidents. The United States Steel Corporation has reduced its accidents 86 per cent; 14 deaths where there used to be a hundred and the number is still going down.

[From Radio Address by Albert W. Whitney.]

Trade, Traffic, and Shipping

Pacific Coast Fresh Fruits in the Philippines

IN the May issue of Pacific Marine Review appeared an article giving a short survey of the export of fresh fruits from the United States. That article was partly based on material appearing in Commerce Reports. In the April 26 issue of Commerce Reports appears an article describing the exports of United States fresh fruits to the Philippines in 1928, written by Assistant Trade Commissioner Harvey H. Rohrer at Manila. This article develops some very interesting material of which the present article is an abstract.

United States exports of fresh fruits to the Philippines

Year	Grapefruit			Lemons		
	Quantity	Value	Average price	Quantity	Value	Average price
	Boxes			*Boxes*		
1926	1,074	$5,301	$4.93	6,499	$32,493	$4.99
1927	1,412	6,940	4.91	6,861	36,473	5.31
1928	1,619	8,456	5.22	6,668	43,347	6.50
	Oranges			Apples		
	Boxes			*Boxes*		
1926	43,618	$229,232	$5.25	106,537	$180,568	$1.77
1927	45,227	223,372	4.93	105,128	195,702	1.86
1928	41,098	241,590	5.87	112,646	186,706	1.65
	Grapes [1]			Pears [1]		
	Kegs			*Boxes*		
1926	17,530	$78,939	$4.50	1,239	$3,758	$3.03
1927	27,539	103,453	3.75	1,006	3,971	3.95
1928	32,588	134,599	4.13	1,332	5,524	4.14
	Berries			Peaches [1]		
	Pounds			*Bushels*		
1926	7,740	$887	$0.11	153	$560	$3.66
1927	6,697	1,064	.16	344	1,022	2.97
1928	13,428	1,198	.11	77	243	3.15

[1] Grapes, pears, and peaches are given in pounds in United States official export statistics; conversions made on basis of 50 pounds to box of pears, 47 pounds to keg of grapes, and 48 pounds to bushel of peaches.

NOTE.—Figures for 1926 and 1927 are from Foreign Commerce and Navigation of the United States, published by the Department of Commerce. Figures for 1928 are preliminary.

The total value of fresh fruits exported from the United States to the Philippines in 1928 was $628,000. This total is made up from various fruits as shown in the table reproduced herewith. It will be noted that apples, oranges, and grapes form approximately 90 per cent of the total, and it is more than probable that practically 100 per cent of the fruit represented here is Pacific Coast fruit.

One notable feature of the fresh fruit trade in the Philippines is that South China is the principal competitor of the United States in supplying fruit to the Islands. Thus in 1927 out of a total of 71,000 boxes of oranges imported into the Philippines, 51,000 came from the United States and 20,000 from China. Of a total of 8100 boxes of pears purchased from abroad in the same year, China sent 4300 boxes, Japan 2300 boxes, and the United States 1500. Some apples from the Atlantic Coast of the United States have reached Manila but apparently there is little market for them in competition with the apples from the Pacific Coast states.

On account of the competition from Chinese, Japanese (Formosa), and local Philippines oranges, only first quality California oranges should be exported to Manila. There is practically no demand at Manila for California oranges running smaller than 176 to the box, and frequently such oranges are sold on the market at considerable loss. A better distribution of orange exports through the season would result in much more suitable prices on the Manila market.

There is a good year-round demand for Pacific Coast lemons in the Philippines, principally owing to the requirements of the United States Navy, which has forty or more ships in Manila harbor from November to April, and the hot weather demand for lemons from March to June. Italian lemons are prohibited entrance on account of the Mediterranean fruit fly. For native consumption all imported lemons come directly into competition with Philippine grown limes; so that the lemon consumption is principally to resident foreigners. The favorite package seems to be the half-box of 150 lemons.

California grape fruit is in heavy competition with pomeloes from China which have been imported into the Philippines almost since the beginning of the Spanish occupation of the Islands.

Pears from the United States are a luxury, the price often reaching 15 cents in gold each. In the humid tropical climate it is very difficult to market Pacific Coast pears without large loss. Winter Nelis pears appear to have a better record in this connection than most varieties.

Wholesaling of fresh fruits in the Philippines is mostly in the hands of Chinese dealers who buy through local indent agents. Retailing is in the hands of Chinese and Filipinos. Practically all shipments of fresh fruit to the Philippines are received at Manila and transshipped thence either by boat or truck. As the demand grows undoubtedly refrigerator truck and boat facilities will be forthcoming and will be an important factor in increasing the market and decreasing the loss ratio. There are five cold storage warehouses in the City of Manila, three of which are available for public use. These plants, however, are located a distance of $1\frac{1}{2}$ miles from the piers, entailing a trucking charge and considerable handling of packages. Outside of the City of Manila, cold storage facilities in the Philippines are extremely rare.

One important item in connection with exports of fresh fruit from Pacific Coast to the Philippines is the fact that there is apparently considerable deterioration of certain fruits on account of poor ventilation in refrigerator chambers on board ship.

Apples, oranges, lemons, and grape fruit as shipped to Manila

have been packed in the standard Pacific Coast boxes, reinforced with metal straps outside; and this package appears to be satisfactory. Grapes are reaching Manila in three types of containers, kegs, drums, and cases. The keg is the oldest package and has recently been giving way to the drum, which has a better storage factor, so far as the ship's hold is concerned, or the box, which is even better than the drum in this respect. However, the Chinese fruit handlers are very reluctant to accept the drum or the box in lieu of the keg, claiming that the grapes do not keep as well as they do in the keg. It appears however, that the real reason for this reluctance is that all kegs, boxes, and nails have a resale value in the Manila market and this resale value frequently represents the only profit accruing to the Chinese dealer from the handling of the fruit. The keg has the highest resale value.

It is evident that one factor necessary to the large increase of fresh fruit imports into Manila is the education of the wholesalers and dealers into the value of the proper refrigeration storage for the holding of fresh fruit, and in order to make the investment in such storage a practical commercial proposition it will be necessary to exploit the Philippine markets for a better year-round use of Philippine grown seasonal fruits, as well as to build up markets for fruits and other perishable food products imported from the Pacific Coast.

Seagoing Pomological Laboratory

THE handling of California perishables under refrigerative shipping on ocean trade routes is to be made the subject of intensive study during the present summer under the present state-wide movement to develop export markets for California's agricultural products.

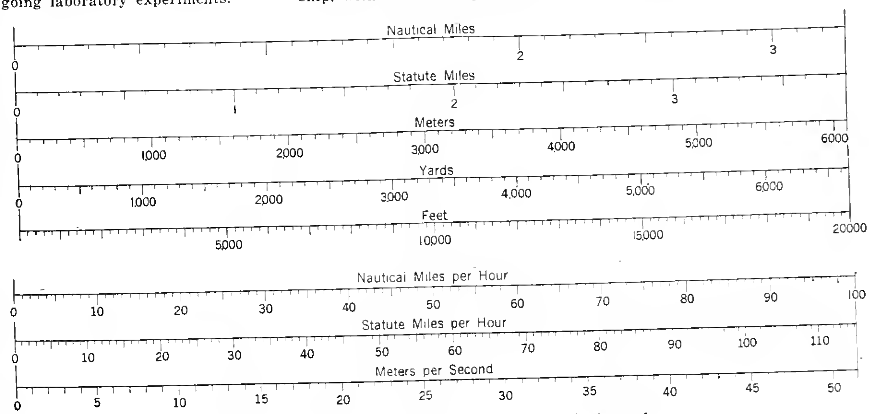
A number of representatives of agricultural interests, of shipping firms, of marine underwriters, of exporters, and of refrigerator equipment interests met in San Francisco recently and agreed on outlines of plans for this work and obligated themselves to raise funds to supply the equipment and expenses of seagoing laboratory experiments.

Professor E. L. Overholser, assistant pomologist of the University of California farm at Davis, California, was chosen to conduct the laboratory. Professor Overholser for a number of years has been carrying on extensive studies in connection with refrigerator shipping by rail, and this work has led to very valuable results. These rail car refrigeration studies were carried out under the auspices of the California Committee on the Relation of Electricity to Agriculture in cooperation with the University of California and other agencies.

It is proposed to carry out experiments along the same line on board ship, with a wide range of perishable products and on a wide range of trade routes. The apparatus used in the refrigerator car tests will be available together with additional equipment supplied by the University of California, which institution is also contributing the services of Professor Overholser to this enterprise.

This will be the first coordinated scientific investigation into the transportation of California perishables in refrigerator ships. The overseas trade in these perishables is growing at a tremendous rate, and the need of adequate technical information for the guidance of growers, packers, shippers, exporters, and ship operators, as well as foreign fruit buyers, has been recognized for some time. It is hoped that as a result of this investigation ship operators will be in a position to offer a very much more effective service in the transportation of California perishables and that Europe and the Far East markets will be served with standard quality in California fresh fruits and vegetables that will enable them to build up extensive markets for these products.

The various committees working on the problem of developing overseas markets are to be congratulated on this very wise and forward-looking development in their plans. Undoubtedly the facts developed from this investigation will contribute much that will be useful in the financing and development of waterside refrigerator terminals for servicing this trade.



A convenient conversion graph for ship operators and foreign traders.

An Interesting Twin-Screw Motorship

Sun Shipbuilding & Dry Dock Company Building Steel Passenger and Cargo Vessel Designed Especially for the New York-South Africa Service

THERE is now building at the yard of the Sun Shipbuilding & Dry Dock Co., Chester, Pennsylvania, an interesting steel, twin-screw, passenger and cargo motorship for the American South African Line, Inc. This vessel is part of the program for the revival of American shipbuilding induced by the liberal loan provisions and postal contracts authorized by the Merchant Marine Act, 1928.

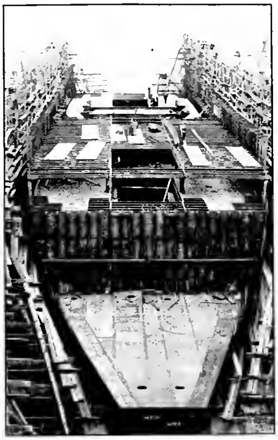
She will be of the flush deck type, with long bridge and topgallant forecastle. She is built on the transverse system of framing and will have a cruiser stern and a slightly raked stem. The hull, as is shown by the plans and profile herewith, will be divided by seven water-tight and oil-tight bulkheads into eight compartments.

There will be two masts, each of which is to be fitted with four 7-ton cargo booms. Two king posts are to be fitted amidships and two king posts at the after end of the bridge, each of which will have a 3-ton boom. There will also be two 3-ton booms at the forward end of the bridge. For lifting heavy pieces, a derrick of 40 tons capacity is fitted on the deck at No. 2 hatch. In the bridge superstructure on the upper deck accommodations will be provided for 56 passengers. Four of the rooms are fitted with private baths. A lounge and a smoking room are to be fitted on the bridge deck; and the main dining room will be on the upper deck.

The general characteristics of this vessel are:

Length over-all	470′ 0″
Length between perpendiculars	450′ 0″
Beam, molded	61′ 6″
Depth, molded	37′ 0″
Designed loaded draft	26′ 0″
Draft, light	11′ 9″
Capacity for fuel oil, tons (approx.)	2000
Cruising radius at 15 knots (naut. miles)	28,500
Shaft horsepower	5,080
Speed, trial, knots	14
Cargo capacity, D.W.T.	7,000

The vessel is to be classed with the American Bureau of Shipping, highest class A-1-E, under special survey, "with freeboard."



Construction view showing twin screw motorship partly framed at the Chester plant of the Sun Shipbuilding & Dry Dock Company.

Propulsion Machinery

The propulsion machinery will consist of two 4-cylinder Sun-Doxford, opposed piston, directly reversible, oil engines, each to develop 2700 shaft horsepower at 100 revolutions a minute. The cylinders of these engines will be 23.62 inches diameter and 79.12 combined stroke. This type of engine works on the 2-stroke cycle, and scavenging air is provided by an attached scavenger pump.

Each engine is to be directly connected to its propeller shaft through a thrust shaft of solid forged steel with solid couplings and a single thrust collar operating in a Kingsbury thrust bearing.

For electric lighting and auxiliary power purposes, three generating sets are to be provided, each consisting of a 335-horsepower, heavy oil engine directly connected to a 220-kilowatt, 240-volt, direct-current generator. For emergency purposes, there will be installed also a 20-kilowatt, 240-volt, direct-current generator driven by a heavy oil engine.

The three generating sets will be Ingersoll-Rand diesel engines, direct-connected to Westinghouse generators. The auxiliary generating set will be a Standard oil engine, direct-connected to a Westinghouse generator.

Auxiliary Machinery

The auxiliary machinery will all be electrically operated, with the exception of one steam engine driven auxiliary air compressor, which will take steam from the boiler used for heating the passenger and crew quarters. This will be a small water-tube boiler of the Roberts type using Ray oil burners.

The windlass will be of the electric, spur-geared type with a capacity for 2½-inch diameter stud link chain. It will be driven by a 65-horsepower motor and will be capable of handling both anchors in 30 fathoms of water at 30 feet per minute.

Twelve single drum cargo winches will be fitted, driven by 25-horsepower motors; two electric, compound-geared, single-drum winches, fitted with clutches for three speeds and driven by 30-horsepower motors; and one electric warping winch.

The steering gear will be of the electric hydraulic type provided with two hydraulic pumps, one acting as a stand-by, and each pump being driven by a 30-horsepower motor. The control will be of the hydraulic telemotor type, with stands in the pilot house and on the flying bridge.

American Engineerng Company is to supply the windlass, the cargo winches, and the steering gear.

A refrigerating plant consisting of two 2-ton Brunswick direct-expansion ice machines will be installed on the main deck. This will service about 5000 cubic feet of refrigerator space located abreast the engine room casing on the main deck, will make 500 pounds of ice daily if required, and will keep a 60-gallon scuttle butt provided with ice water.

Lubricating Oil

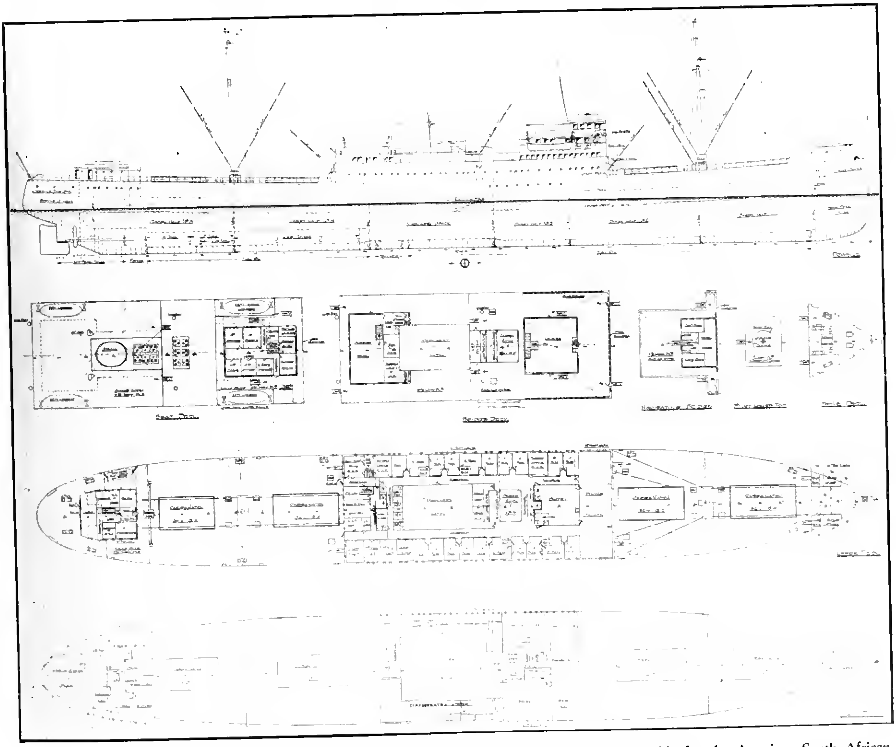
The lubricating and fuel oil systems have been worked out with considerable care to insure clean

oil at all times. Two storage tanks for lubricating oil are located in the engine room. One of these is used for fresh clean lubricating oil and the other, fitted with steam coils, is reserved for dirty oil. During operation, the lubricating oil pump draws oil from the engine sump tank, which has been filled from the clean oil storage tank. This oil is discharged either through the oil cooler to the engine or directly to the engine without the use of the cooler. A lubricating oil purifier will be installed and so connected that part of the oil can be passed through the purifier while the engine is in operation. The clean oil from the purifier will be returned to the sump tank through a separate pipe. If it be decided to clean all of the oil in the engine system, the contents of that system will be pumped up into the dirty oil tank and clean oil admitted to the engine from the clean oil tank. The dirty oil in the tank will then be heated by the steam coils and run by gravity through the oil purifier to a small lubricating oil tank, from whence it will be pumped to the clean oil storage tank by means of the stand-by lubricating oil pump. This operation may be performed either at sea or in port.

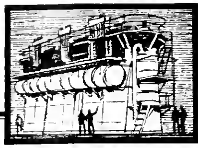
Fuel Oil

The fuel oil system for both main and auxiliary engines has three service tanks. Two of these are for clean oil and the third for bunker oil. In operation, the bunker oil service tank is filled by means of the transfer pump. Oil from this tank drops by gravity to the fuel oil purifier located on the engine room floor. The purified oil runs by gravity from the purifier to a tank fitted with a float valve that controls the operation of a motor-driven centrifugal pump. As long as oil is discharged into this tank the pump will pump this clean oil into either one of the two clean fuel service tanks, from either one of which it flows by gravity to the main engine fuel pumps or the auxiliary engine fuel oil service tank. Bunker oil service tank will be fitted with steam heater coils for heating the oil to the proper degree for most efficient purification in the centrifugal separator.

Sharples Specialty Company will furnish the centrifugal purifiers for both lubricating and fuel oil. Motors for driving the auxiliary machinery will be furnished by Westinghouse Electric & Manufacturing Company.



Outboard profile and general arrangement deck plans of twin-screw steel passenger and cargo motorship for the American South African Line. Note pleasing appearance of raked stem, cruiser stern, and sheer line.



In the Engine Room

The New Chief Takes Over

By A. G. Elliott

THE limited time spent at their home port by freighters and oil tankers, especially ships hailing from San Francisco and Los Angeles harbor, makes the changing of a chief engineer a hurried transaction. Usually steam is on the boilers, bunkers are being pumped on board, some voyage repairs are being carried out, the crew is being paid off, and, all too often, new men are signing on in their places. The port engineer may be on board satisfying himself that the condition of the machinery is good and that the engine room is reasonably clean.

A thorough inspection of the machinery is, of course, impossible under these circumstances; but, with the exception of an actual break down of the machinery, attention to the following items will usually avoid trouble on board a steamer.

Boilers

Distortion in the furnaces of a Scotch boiler may be easily detected by shining a spotlight along the top of the furnace and observing the regular curve of the rings with each other, any flattening is at once seen. If a ring should look flat, it may be checked up with a tram gauge. When looking over the furnaces, any leak in the back ends can be detected if there is steam on the boiler. If the boiler is dead a visit to the combustion chambers is, of course, necessary. Test the boiler try cocks, water column valves, and gauge glass cocks; it may be that they have become crusted up during the voyage. Trying to clear a tight water column valve stem, if anything should go wrong with the gauge glass cocks, does not occur the second time in the career of a good engineer.

Feed Water

The salinity and alkalinity of the water in the boilers is the work of a few minutes only. A surface and blow does not do any harm, and it gives a line on the condition of the surface, blow and ship's side connections. A new chief should make very sure that his boilers are in good steaming condition if he wishes to sleep at night during the voyage with an easy mind. An old Scotch chief once said to the writer: "Mon, most any men ye get can fix an engine, but it tak's a braw laddie tae fix a boiler once she's under steam."

Condenser Leaks

A nitrate of silver test of the condensate from the main condenser and of the water from the feed and filter tank will detect any leak that may exist in the main or auxiliary condensers. Testing for a small condenser leak at sea is about one of the meanest jobs an engineer can find. When one is at this water testing job, a look into the feed and filter tank and also into the fuel heater drain tank will show whether there is an oil leak into the feed water. In oil tankers an inspection of the drain tank should be made very frequently when heating up the cargo before arriving in a discharging port. If opportunity permits, a sample of water should be pumped from fresh water tanks —especially the double bottom and peak tanks — and a salinity test made.

Feed Pumps

Change over to either feed pump

MARINE ENGINES UNDER CONSTRUCTION IN THE WORLD.

This table shows the country of build, the type, number and horse-power of engines (intended for the propulsion of sea-going vessels) which were either under construction at the works, or being installed on board vessels, at the end of March, 1929. (The horse-power is compiled from figures furnished by the engine makers.)

Country of Build.	Steam Engines. Reciprocating. No.	Steam Engines. Reciprocating. Indicated H.P.	Steam Engines. Turbines. No.	Steam Engines. Turbines. Shaft H.P.	Oil Engines. No.	Oil Engines. Indicated H.P.	Total. No.	Total. Horse-power.
Great Britain and Ireland	243	364,393	36	277,960	75	374,945	354	1,017,298
Belgium ..	1	7,500	2	31,000	—	—	13	38,500
Denmark ..	6	8,050	—	—	34	188,700	40	196,750
France.. ..	6	14,740	2	67,000	4	43,800	12	125,540
Germany ..	35	77,115	Not	available	44	170,710	79	247,825*
Holland ..	15	18,440	4	9,850	18	80,485	37	108,775
Italy	3	4,550	—		14	69,300	17	73,850
Japan	6	12,420	1	6,500	12	59,595	19	78,515
Norway ..	37	28,010	—	—	2	8,000	39	36,010
Russia.. ..	6	5,700	—	—	9	34,480	15	40,180
Sweden ..	3	1,690	—	—	109	95,620	112	97,310
Switzerland ..	—	—	—	—	20	88,150	20	88,150
United States..	4	9,000	11	92,290	13	22,390	28	123,680
Other Countries	12	21,900	—	—	1	2,500	13	24,400
Total ..	377	573,508	56	484,600*	355	1,238,675	788	2,296,783*

* Excluding turbine engines being built in Germany.

and pump through both main and auxiliary feed lines. On some ships the feed lines are not changed over, thus allowing the dead line to become crusted up.

Lubricating oils, packing, and other running stores being checked up, the chief can then turn his attention to the fuel.

Fuel Oil

Fuel oil, on the Pacific Coast, is almost sure to be delivered to the ship clean and free from water, at least not more than 4/10 of 1 per cent water. Some engineers may question this statement; but this is the writer's experience during quite a number of years of handling oil on the coast. He has had dirty fuel at times but has invariably found that the ship was at fault. To recall one instance, a double-bottom tank had been steamed and washed out at sea on account of a defective suction line which required to be renewed. The work inside the tank was done and the tank inspected. The deck engineer was left on the job to rejoint the manhole plate. At this time an industrious boatswain decided it was a heaven-sent opportunity to get his tank top clean, which he proceeded to do by washing sawdust, rust, scale, and other dirt into the double bottom; an expensive tank top cleaning.

Another reason for water trouble in oil is the use of the double bottom tanks for ballast. Some skippers have a positive mania for filling these tanks with water as soon as the oil is out of them. The tank may have been slack and have had a free surface of oil for a week, that does not seem to worry the skipper as much as an empty tank. Using double bottom oil tanks for ballasting should not be done, except in emergency, because of the difficulty of pumping the tank free from water. It is estimated that water in the fuel oil will increase the fuel consumption 10 per cent, as well as slow down the speed of the ship.

The new chief's first attention then should be to make sure that there is not any water in the bottom of the bunker tanks. This may easily be done by using the low suctions on the settling tanks and drawing a little on each bunker tank with the transfer pump into the settling tanks.

If bunkering has not started before he joins the ship, the quantity of oil on board should be measured and checked with the amount in the log book. If bunkering should have started, a check of the oil on board after bunkering is finished will give an approximate quantity of the oil on board.

Finally, satisfying himself that there is sufficient stationary on board for the voyage, a chief may, with confidence, take almost any steamer to sea when he knows the foregoing details are in good order.

Announcement

One of the most important factors for the economical production of power in modern steam plants is the maintenance of high vacuum. This is particularly and increasingly true in connection with the use of up-to-date turbines and higher steam pressures. The design, equipment, operation and maintenance of condenser plant is therefore of very great importance to the marine engineer. Having this in view, Pacific Marine Review has arranged for a series of articles embodying the results of engineering and scientific research by the world's experts on the design and maintenance of marine condensers and their auxiliaries.

Some Interesting New Ships Building Abroad

DETAILS are now available of the new Canadian Pacific North-Atlantic liner Empress of Britain, ordered last fall from John Brown & Company, Clydebank. She will be 755 feet long, 97 feet 6 inches molded beam, and of 40,000 tons gross measurement. The arrangement of passenger accommodations shows a capacity for 1150 first, third tourist, and third class combined. This indicates very spacious bedrooms and public rooms for all classes. The Duchess class C.P.R. liners shows a larger complement of passengers on a much smaller measurement. The machinery is to be single reduction gearing.

Largest French Motorship

French owners are going in more and more for motorships. Chantier & Ateliers, St. Nazaire-Penhoet, recently launched the Companie Generale Transatlantique liner Lafayette, which is to be driven by four M.A.N. 2-cycle double-acting diesel engines developing a total of 18,500 brake horsepower. She is the largest French merchant vessel designed for propulsion by internal combustion engines, having a displacement of 25,600 tons and an overall length of 613 feet, while her nearest rival, the Messageries Maritimes' Felix Roussel, to be launched next October, is of 22,000 tons and measures 568 feet in length. The other general dimensions of the Lafayette are: breadth, 78 feet 9 inches; depth, 50 feet 10 inches; and loaded draught, 30 feet 10 inches. Accommodations will be provided for 639 cabin class, 332 tourist, and 108 third class passengers. She is due for delivery next spring, when the Companie Generale Transatlantique intend to operate a weekly service with her, the De Grasse and the Rochambeau on the Havre-New York run. Special interest attaches to the fact that two of her main engines were constructed by the Penhoet firm and the other two by the M.A.N. Company. Each engine will be directly coupled to a propeller shaft, and the estimated speed is 18 knots.

Floating Whale Oil Refinery

Workman, Clark, of Belfast, recently launched the 20,000-ton whale oil refinery ship Kosmos for Norwegian owners; and Armstrong, Whitworth and Co., Newcastle-on-Tyne, received an order for another large vessel of the same general type. The Belfast vessel will have quadruple expansion steam engines of 5000 horsepower, situated aft, obtaining steam from five oil-fired boilers fitted with superheaters; she will have a service speed of 11½ knots; will carry plant capable of refining 2500 barrels of oil per day, and her carrying capacity will be 120,000 barrels. She will act as mother ship to a fleet of steam whalers now under construction on the northeast coast of England, and will be fitted with special appliances for hauling the whales on board. The contract price was $1,375,000, and, in addition, about $175,000 will be spent on the refining appliances and machinery. The owner is the Kosmos Whaling Company, of Oslo, which ordered the vessel in September of last year.

Workboats and Their Power Plants

A Comfortable 65-foot Seagoing Cruiser

Nunes Brothers' Boatyard Building Twin-Screw, Hill Diesel Driven Motor Yacht for Edwin F. Merry

A NEW cruiser, which is now being built at the yards of Nunes Brothers, Sausalito, California, for Edwin F. Merry, president of The Merry Company, Inc., manufacturer of Golden Seal Batteries, is one which is going to attract widespread interest both because of the somewhat novel arrangement of the quarters and because of its diesel engine propulsion plant.

The hull is to have dimensions of 65 feet length over-all, 14 feet beam, and 4 feet draft. The owner's stateroom is forward and will have two built-in berths, one of them a full size and the other three-quarters size bed, in addition to the settee and lockers. This stateroom opens into the pilot house aft and into a lavatory forward.

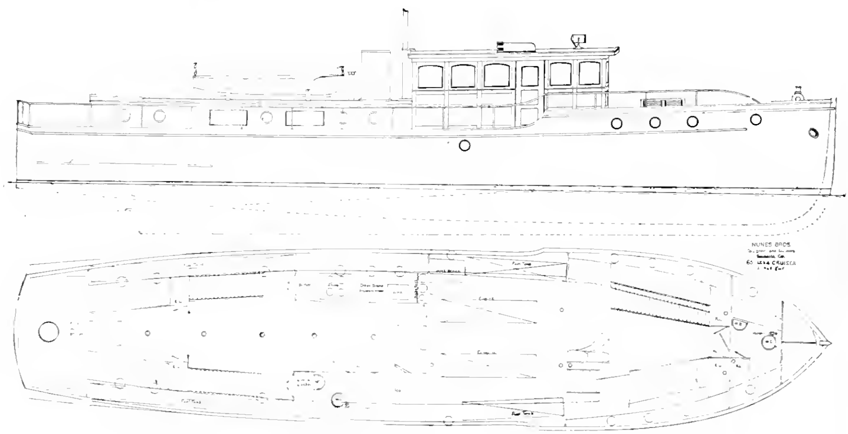
The pilot house, which is over the engine room, is larger than is ordinarily used, so that it may serve also as a deck house and dining saloon. Large hatches give ample opportunity to work on the engines when such work is required.

Stairs from the pilot house lead down into the after cabin, in which is located the galley, dining quarters, and additional bunks. It will be noted from the plan that this after cabin departs materially from the conventional design of motorboat, in which this space, which in Mr. Merry's cruiser will be one large cabin, is usually divided up into two or three staterooms. Mr. Merry's cruises with similar, though somewhat smaller boats has indicated the desirability of having one large cabin; and the design as worked out is based on his previous motorboating experience.

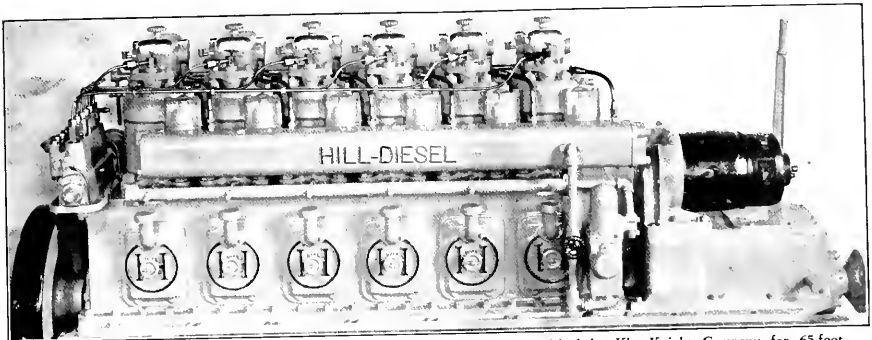
The four bunks in the after end of the main cabin, two upper and two lower, are built in and permanent. Forward of these are two settees which can be used as emergency bunks and which will be used as seats for the dining table in the event the cruiser is under way and it is desirable to dine below. At anchor in normal weather the pilot house will be used as a dining salon.

The galley is very complete, as can be seen from the arrangement plan, incorporating a four-burner Lang range, with ample working room at sink, and a large ice-box built in on the opposite side. Just aft of this is a well arranged toilet room.

For power plant, Mr. Merry has selected two of the new 6-cylinder, 5 x 7, pump injection type Hill diesel engines, manufactured at Lansing, Michigan. The injection system employed in these engines builds up pressure in the fuel line to each cylinder only during the period of injection, and it is possible to closely regulate the amount of fuel going to each cylinder so that an absolute balance of power is obtained between the different cylinders.



Outboard profile and arrangement plan of the 65-foot cruiser.



One of the 6-cylinder, 60-75 horsepower, marine type, Hill diesel engines furnished by King-Knight Company for 65-foot cruiser.

The 6-cylinder, 5 by 7, Hill diesel engine is conservatively rated 60 horsepower at 800 revolutions a minute and 75 horsepower at 1000 revolutions a minute. These two engines will give this boat a cruising speed of 12 knots and a maximum speed of 13 knots; and with the wide cruising range given by the economical performance of the engines Mr. Merry can cruise anywhere on the Pacific Coast without difficulty.

As an emergency precaution, he has had the engines, which are equipped with electric starting, furnished also for air starting; so that in case of trouble with the electric starter or the storage batteries they can be started by air.

The performance of the Hill diesel engine with the pump injection system and West Coast fuels has been very successful. A single-screw installation of this same size engine is now being made by Fellows & Stewart at San Pedro.

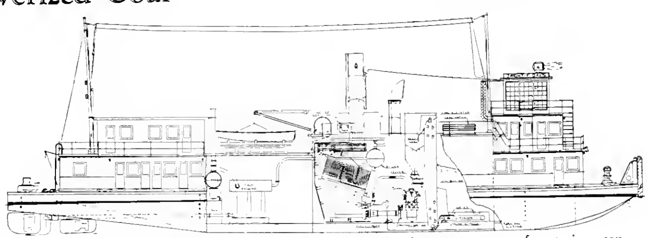
Mr. Merry is building this boat for extensive cruising up and down the West Coast of North America, going down into the Gulf of California and north to Alaska, and hence has sacrificed somewhat in the matter of speed to obtain a very strongly constructed boat with good seagoing ability capable of meeting any weather conditions. The planking is 1-5/8 inches, the frames 2½- by 2½-inch oak, spaced on 12-inch centers, except in the engine room where they are spaced on 8-inch centers. The keel is 5½- by 11½-inch Oregon pine, with an iron bark shoe, this keel being bolted solidly to a 5½- by 11½-inch keelson. The engine timbers are 8 by 12 Oregon pine and extend 9 feet fore and aft of the engines so as to distribute weight and driving stresses and eliminate vibration.

It is interesting to note that a number of prominent yachtsmen have recently placed orders for the equipment of cruisers with the new Hill diesel engine.

An Interesting River Towboat Burning Pulverized Coal

THE Dwight F. Davis, a river towboat, recently completed for the Inland Waterways Corporation by the Charles Ward Engineering Works, Charleston, South Carolina, has features of design and construction that are of considerable interest. She was designed and built for use on the Warrior River and, as this river is inherently a coal stream, it was decided to equip this boat with pulverized coal burning equipment. The Inland Waterways Corporation had previously converted the river towboat Illinois to powdered coal burning, and the experience derived from the operation of this tug enabled them to produce a design for the new boat which is calling out considerable favorable comment from marine engineers.

The Dwight F. Davis is 140 feet long, 25 feet beam, and has a draft of 7 feet. She is powered with two triple-expansion steam engines 10¼ by 16½ by 27 inches with an 18-inch stroke, designed to develop 500 indicated horsepower each at 220 revolutions. Probably the only unique feature of these engines is that they are designed for maximum economy to develop an indicated horsepower for 13 pounds of steam at 275 pounds pressure when working against a vacuum of 26 inches. They are entirely force-feed lubricated and are very adaptable to this boat when all things are taken into consideration, such as weight, space, economy, and reliability. These engines drive propellers of 7-foot diameter with a 4 feet 6



Sectional profile of the river towboat Dwight F. Davis showing arrangements for storing, conveying, pulverizing, and burning of her coal fuel.

inches pitch. The propellers are in tunnels, as it is necessary to get the largest diameter propeller on the least draft possible.

Two Babcox & Wilcox marine type water tube boilers are installed of 2200 square feet heating surface each and each boiler has a furnace volume of 250 cubic feet. They are set one foot higher than the usual marine practise for boilers designed to burn oil and have an air preheater.

The pulverized coal equipment consists of two completely separate units, one for each boiler, each unit consisting of one 20-inch Fuller-Lehigh table mill with the necessary separately driven feeder and primary air fan. This table mill is a recent development in the pulverized coal game and is particularly adaptable to this installation. It consists of a motor driven shaft with a conical table keyed on the vertical shaft. The table has a variable speed of some 450 to 900 revolutions. Between the table and the grinding ring there are three steel balls of about 90 inches diameter which move in the annular space between the moving table and the stationary grinding ring. Rotation is given to the balls by the action of the rotating table, but of necessity the peripheral speed of the balls is about half that of the table, due to the slip between the balls and the table. The coal is fed into the top of the housing of the mill and is ground between the balls, the table and the grinding ring.

Progress In Design

The equipment on the Illinois weighs about 25,000 pounds per ton of pulverizing capacity, while the equipment on the Dwight F. Davis weighs 10,000 pounds per ton of pulverizing capacity. The equipment on the Illinois consumes 18 per cent of the steam generated in the boiler for pulverization and burning of the coal. The equipment on the Dwight F. Davis consumes 6 per cent of the steam generated for pulverization and burning of the coal. It is believed a reasonable statement to make that if a new pulverized coal boat were to be designed today, with ample space allowance, a pulverized coal installation could be laid out that would use about 3 per cent of the total steam generated in the boiler to pulverize and burn the coal.

The furnace on the Dwight F. Davis is a plain brick furnace of about 250 cubic feet furnace volume. In this furnace is burned as high as 1500 pounds of coal per hour, although the normal rating will be probably about 1000 pounds per hour. The combustion of 1000 pounds of coal per hour will mean a heat release of about 50,000 B.T.U.'s per cubic foot of furnace volume. Plain refractory lined shore stations are designed on a basis of heat release of 15,000 B.T.U.'s per cubic foot of furnace volume and have reached as high as 22,000 B.T.U.'s per cubic foot with a high fusing ash coal. In trials so far, as much as 1500 pounds of coal per boiler have been burned with no sign of slagging of any kind and no trouble is anticipated from slagging of the furnaces, providing coal is burned with a minimum of 2500 degrees fusing point of ash.

The Hawaiian Tug Mikimiki

Young Brothers of Honolulu Getting Satisfactory Service from Another Fairbanks-Morse Equipped Tug built by the Ballard Marine Railway of Seattle

MIKIMIKI (Hawaiian for "alert and ready to go") was built by the Ballard Marine Railway of Seattle for Young Brothers of Honolulu from designs laid down by L. H. Coolidge.

The Mikimiki has an over-all length of 125 feet, a beam of 28 feet, and a depth molded of 16 feet.

Quartering view of the Mikimiki on her trials on Puget Sound.

She is propelled by two 560-horsepower, 4-cylinder, Fairbanks-Morse diesel engines, and on the trial trip covered a measured mile at the rate of 10.84 knots at rated engine speed. From Seattle to Honolulu, a distance of 2569 miles, the Mikimiki, towing a 1000-ton capacity steel barge, made the trip in 11 days, 14 hours, and 16 minutes, in spite of the fact that for six days severe weather necessitated slowing the engines to about half the rated speed. On the last two days the tug averaged better than 10 knots an hour. The total fuel consumption for the trip was 13,000 gallons.

Auxiliary Machinery

In addition to the two main engines there is also a Fairbanks-Morse diesel auxiliary generating set with built-in 40 kilowatt, 125-volt generator. On the opposite end of the engine from the generator is a clutch-connected, 2-stage, 6¼ by 3-1/8 by 5½ inches air compressor with a capacity of 50 cubic feet.

Other auxiliaries consist of a 6- by 10-inch duplex piston pattern power pump operating at 150 pounds pressure which is gear-driven by a 20-horsepower, 1200-revolutions per minute, Type DHM, direct-current motor for fire and auxiliary pump purposes. This pump has a 5-inch suction leading to the deck with a hose connection for salvage pumping. A 1½-inch centrifugal pump direct-connected to a 2-horsepower, 1800 revolutions per minute motor handles the sanitary system and is also used for bilge pumping and washing down the deck. An auxiliary circulating water pump unit is made up of a 3-inch centrifugal pump direct-connected to a 7½-horsepower, 1800 revolutions per minute motor.

The auxiliary lubricating oil circulating pump is a rotary pattern, direct-connected to a 7½-horsepower, 1750 revolutions per minute motor. This unit has a capacity of 1000 gallons a minute.

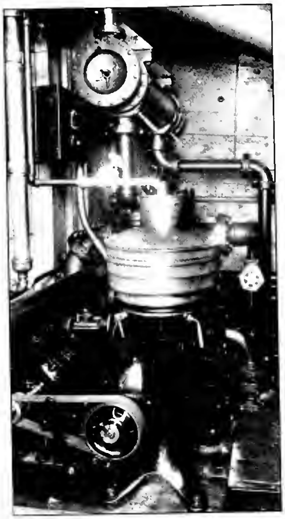
A No. 360 De Laval centrifuge, driven by a 2-horsepower, 1200 revolutions per minute, direct-current motor, is used for reclaiming the oil from the lubricating system and the piston cooling. This unit is located on the port side forward of the engines and there is a 6-kilowatt bayonet type oil heater mounted above it. The lubricating oil standards and coolers are located on vertical steel braces forward of the fuel oil tanks and are interconnected in such manner as to permit their use with either engine.

Starting Air

Five air tanks, constructed in accordance with requirements of the American Bureau of Shipping, are installed, four 30- by 144-inch located aft, two on starboard side, and two on port side; one 16- by 36-inch located under deck on starboard side aft. All tanks are interconnected with air lines leading to air compressors on the main engines and auxiliary. The 16- by 36-inch is kept locked as an emergency unit to start auxiliary engine in case pressure in main tanks is lost.

Fuel Oil

Three tanks are used for fuel oil: Two in wings of the vessel slightly forward amidships, each tank being of approximately 9500 gallons capacity; one tank aft of after engine room bulkhead holding approximately 11,000 gallons. This tankage gives a total capacity of 29,000 gallons or a cruising radius of approximately 5900 miles. All fuel oil pumps on main and auxiliary engines take the fuel from the manifold line in to the engines, and overflows back into the same line. Strainers are provided in fuel oil manifold line ahead of engine pump sections.



De Laval oil purifier, which takes care of the lubricating oil for the Mikimiki's engines.

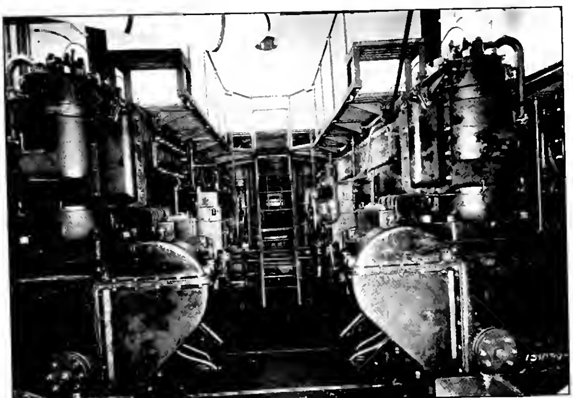
A lubricating oil tank of 900 gallons capacity is located in the center of the ship, fore and aft, between the two forward fuel oil tanks, with Type A-8 Edison storage batteries of 100 cells, 300 ampere hours capacity on top of it. The batteries are covered with boards forming the floor of a passage way from the engineroom to the forward part of hull.

Deck machinery on the Mikimiki is all electrically driven and was all furnished by Allan Cunningham of Seattle. It consists of a combination windlass and capstan forward driven by a 20-horsepower General-Electric motor; an electric towing machine with a drum capable of handling 1600 feet of 1½-inch steel cable and controlled by a 35-horsepower General-Electric motor; and a steering gear.

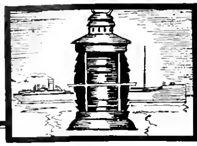
The Mikimiki's hull is built for arduous ocean service. The frames are chiefly of Douglas fir and all deck beams and top timbers and the upper portion of the main frames are of yellow Alaska cedar. The bulwarks are built up solidly, heavily edge-bolted, and capped with 4-inch ironbark railing. From the stern of the main house around the after bulwarks a ¼-inch steel plating is capped over the railing as a protection against chafing by the steel wire hawser. Around the port and starboard aft corners of the main house a ribbing of iron bark is placed to prevent the lines from chafing the house.

The officers and crew's quarters are spacious and comfortable. The tug's complement is captain, two deck officers, four men forward, chief engineer, two assistants, two oilers, cook, and messboy.

The bulk of the Young Bros.' towing work in Hawaii is in connection with the pineapple industry. This industry has grown to such proportions as to produce a tonnage far beyond the barge and towboat capacity of Young Bros.' extensive fleet until the Mikimiki was added. John A. Young, vice-president and general manager of Young. Bros., came to the Coast to handle the details connected with the building of the new tug. The two 560-horsepower units are the largest diesel engines in the fleet, as the Mahoe, the second largest tug, is equipped with two 360-horsepower units. This new tug is unquestionably one of the finest diesel powered tugs in the world.



View of the engine room of the tug Mikimiki showing the two 560-horsepower Fairbanks-Morse diesel engines and their controls.



Auxiliaries—Ship Supplies—Marine Equipment

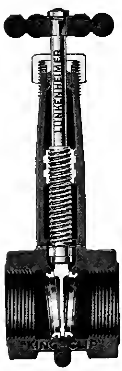
Lunkenheimer King-Clip Gate Valve

THE Lunkenheimer Company, Cincinnati, has developed a new valve—the King-clip gate valve. The field for its use is virtually unlimited, as its design contemplates equally satisfactory results on steam, oil, gas, air, water and gasoline lines. The valve as a whole is exceptionally rugged, built to withstand rough usage.

King-clip valves are made in three designs—raising stem inside screw, outside screw and yoke and quick operating. All types are procurable in iron body bronze mounted and all-iron patterns, with screw or flange ends.

Body is made of iron, especially alloyed for valve service. Substantial hexagons resist wrenching strains and piping stresses. Thread length accommodates both American Standard and A.P.I. line pipe. When screwing up a valve there is no danger of pipe ends jamming against diaphragm or seats.

Flange and valves have flanges of the 125-pound American Standard for iron flanges and are plain faced. Face to face dimensions on flange end valves are standard trade practice.



Inside screw type.

The steel clip provides a simple but effective method of securing the connection between the body and bonnet. It greatly facilitates dismantling the valve for cleaning or inspection and lends strength and rigidity to the body.

Stuffing box holds ample supply of packing. Coarse thread for screw stuffing box offers greater resistance to corrosion and insures longer life. Screwed stuffing box nut is used in valves up to 3 inches inclusive; sizes 1 inch to 3 inches inclusive have gland follower. A bolted iron gland is used in $3\frac{1}{2}$ inch and 4 inch valves.

Outside screw and yoke type.

The bronze bushing in bonnet in inside screw and quick operating iron body bronze mounted valves is an exclusive Lunkenheimer feature. It provides a non-corrosive contact with bronze stem, protects stem threads and insures easy operation. Outside screw and yoke valves, both iron body bronze mounted and all-iron, have bronze bushing in top of yoke.

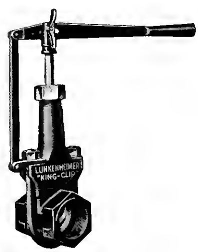
The stem has rugged, wear-resisting thread of generous length, always in full contact with thread in bonnet, with valve open or closed. Shoulder above stem thread forms tight contact with seat under stuffing box, permitting repacking valve under pressure when wide open.

The disc is sharply tapered, making the valve also adaptable for handling heavily impregnated fluids. Disc-stem connection in iron body bronze mounted valves is in the form of a horse shoe band—a construction which imparts extra strength to this part.

Seat rings are permanently rolled in. The method of inserting the seat rings in the body makes it impossible for the rings to become loose.

Handwheel is held on stem by a brass locknut. Sizes $\frac{1}{4}$ to $2\frac{1}{2}$ inches inclusive have ball handwheel; larger sizes have plain rim handwheel.

Iron body bronze mounted valves, inside screw patterns, have iron body and bonnet; bronze bonnet bushing, disc, seat rings, stem, stuffing box nut and gland; steel clip. Quick operating sliding stem patterns are of similar material construction to the inside screw patterns, except that the handwheel is replaced by an iron lever attachment which permits practically instantaneous valve operation. Outside screw and yoke valves have iron body, yoke and gland; bronze yoke bushing, disc, seat rings and stem; steel clip.



Quick operating type.

In the all-iron patterns, all parts except the bronze yoke bushing in outside screw and yoke valves, are made of ferrous metals. All iron valves are for use in handling solutions which attack bronze but not iron. Sizes up to 2 inches inclusive have permanently rolled in steel seat rings; larger sizes have integral seats.

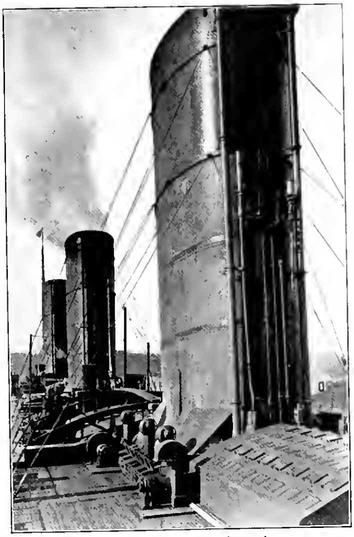
Pressure ratings of Lunkenheimer King-clip gate valves are as follows: Screw ends 1/4 to 2 inches, inclusive—150 pounds working steam pressure, 225 pounds gas or liquid pressure; screw ends 2 1/2 to 4 inches inclusive, and flange ends 1 1/2 to 4 inches inclusive—125 pounds working steam pressure, 175 pounds gas or liquid pressure.

Further information will be furnished by any Lunkenheimer distributor or branch office, or by the Lunkenheimer Company in Cincinnati, Ohio.

Safety In Use of Wire Rope

By I. L. Stone,
Supervising Field Engineer (Western District),
Globe Indemnity Company

SAFETY, life, and strength of wire rope are governed by five factors. These are: external wear, internal wear, fatigue due to bending and overstressing, lack of lubrication, and occasionally kinking. Each of these factors is controllable by either improved operating methods or better selection of rope types and constructions.



Funnels of the Leviathan, featuring wire rope stays.

Any effort to reduce external wear on rope is lost if first all sheaves are not inspected for alignment, size, and condition. Sheaves with over-size bores, broken flanges, or worn treads greatly accelerate wear on wire rope and encourage the jumping of sheaves—the latter being as dangerous to workmen as any other element, save actual breakage. Accurate sheave alignment, smooth sheave treads, correct groove sizes, and proper lubrication will do much to reduce external wear of wire rope, lengthen the rope's life and service, and reduce accident hazards.

Few general recommendations can be made on the matter of sheaves, since so much depends upon existing, individual conditions. Whether a hard or soft sheave is employed is a matter that must be determined by the individual operator. Generally speaking, hard metal treads in sheaves are a means for prolonging wire rope life. Whether or not it is more economical to replace the sheave than the line is also determinable only by individual conditions. According to the Bureau of Mines, however, a rope should be replaced when the diameter of the outside wires has been reduced by wear to sixty-five per cent of its original sectional area—or when as many as six broken wires appear in any one lay of 6x19 rope.

Internal Wear

Wire rope life and service are affected very materially by internal wear. According to D. F. McCurchy of the Industrial Commission of Ohio, "Being flexible, there is considerable internal motion in the wire rope itself as it changes direction under load, as when passing over sheaves."

It must be apparent to everyone that where friction is set up there is a tendency to wear the rope from within—to break down the internal wires, an action that can be corrected only by thorough lubrication.

Said Mr. McCurchy before the Construction Section of the Seventeenth Annual Safety Congress, "Where the rope is subjected to reverse bends, as in the case of the load line on a derrick passing from the hoist engine under a sheave at the bottom of the mast and over a sheave a short distance up the mast, this stretching shifts from one side of the rope to the other, increasing the internal motion and consequently the internal wear. It follows that the smaller the sheave, the greater the stretch in the outside wires.

"Internal wear can be materially reduced by proper lubrication and the use of larger sheaves. The latter is not always possible, being limited by the design of the equipment; but larger sheaves will pay their added cost in increased rope life wherever conditions permit their use.

"The value of lubrication cannot be stressed too strongly and the additional cost of lubricating them is negligible when compared with the increased life resulting. Proper lubrication will minimize the breaking of interior wires which weaken the rope and which cannot be detected by casual inspection."

Kinking

Perhaps one of the most important factors in the destruction of wire rope and in the creation of wire rope hazards is kinking. Kinking is an inherent characteristic of wire rope which has been made in accordance with the old or ordinary methods. Elimination of this destructive tendency is possible by either the selection of preformed rope or through the employment of greater care in handling. In taking wire rope from a reel or drum it is best either to roll the reel along the ground or to mount the reel on an axis then run the rope off as needed. Employing the same method when taking rope from a coil will permit the rope to lie flat, thus preventing kinks. Never unreel or uncoil wire rope as you might a hemp rope.

Because of the internal stress that is inherent in the wires and

strands of ordinary wire rope there is a marked tendency of the rope to be "cranky." Repeated field service, however, has shown preformed wire rope to be remarkably free from this dangerous "crankiness."

Projecting Wires Most Dangerous

Not long ago a letter came to my attention from the Keller Foundry Company in Knoxville, Tennessee. In this letter Mr. Keller commented at some length regarding the accident hazard attendant upon the kinking and the breaking of wires in ordinary wire rope. The writer of this letter said:

"In sling and hoist service ordinary wire rope kinks badly. Still worse, just the moment the rope is worn a bit the broken wires stick out and jag the workmen's hands. Workmen handling ordinary wire rope, particularly in this section, do so only with fear. Preforming a wire rope, however, eliminates the internal torsional stresses of the individual wires and strands and this elimination permits any broken wires to remain in place and to lie flat—thereby eliminating the jaggers which tear workmen's hands and frequently cause blood-poisoning.

"In skidding logs down our Tennessee mountains it is the custom of the workmen to pull a 3 8-inch line to the top of the mountain to be logged. This small line is here run through a snatch-block and pulled back down the mountain to the steam skidder where it is fastened to the skidder drum. The skidding line (much larger in diameter) is then pulled up and down the mountain on this first small diameter rope.

"Unless one has seen the operation one has no idea of the amount of work involved in pulling this small line to place. Ordinarily worn out cable is used for this purpose and in handling it the workmen suffer considerable injury to their hands because of the projecting broken wires. Frequently, these injuries develop into serious sores and lay men up for several days. I once saw a pair of hands that had kept its owner idle for weeks.

"All injuries to employees are paid for either directly by the employer or indirectly through the insurance company. This, of course, means loss to the operating company. Of far greater concern, however, is the injury to workmen. I have had the broken wires of ordinary wire rope jag my hands and I know only too well that the rust, dirty oil, and the acid with which the core of the rope is impregnated during fabrication cause very painful sores and in many cases serious blood-poisoning. More and more our logging firms are learning the wisdom of employing preformed wire rope for this type of service."

While a great deal depends upon the crane or shovel operator, it frequently happens that wire rope will snarl itself when a clam-shell overturns or a load slips. Such occurrences frequently produce kinks and sometimes destructive snags. No end of pains and extreme care are necessary in unsnarling wire rope. Let me emphasize here that wire rope which once has been snarled or badly kinked should never be replaced in service without first close inspection and perhaps tests for strength. In fact, a kinked rope is always a dangerous rope.

Types of Connections

My experience with wire rope operators in almost every field has forced home the realization that there is still wide spread many erroneous beliefs regarding wire rope connections and attachments; this, in spite of the very plain instructions issued by every reliable wire rope manufacturer.

Clip connections will develop efficiencies of better than 80 per cent. when they are properly applied. This type of connection, however, is improperly applied a surprisingly large number of times. Too many riggers seem to prefer to stagger the clips, then pull the U-bolts up so tight as to crush the rope, with a resulting destructive action that greatly reduces the safe operation of wire rope. The proper use of clips involves placing all U-bolts on the same side of the rope (the short end), and none of them pulled so tight as to crush the wires. These clamps should be retightened after the load is applied, then inspected regularly, because such a connection is probably no more than seventy-five per cent efficient.

Socketing wire rope is another type of attachment entirely dependent upon the varying human element for its efficiency percentage. This is because so much importance attaches to the method of cleaning the wires, the thoroughness with which the job is done, the degree of heat for the molten babbit or zinc, how well the wire rope has been broomed to wedge into the basket, and finally how efficiently the molten metal has penetrated into every crevice of the broomed or wedged rope end.

The preformed type of rope mentioned above lends itself exceptionally well to the attachment of fittings or clips because it requires no seizing when cut and because of its ease in handling. Indeed, in passenger elevator ropes the preformed type has made possible a small cylindrical type of fitting which is processed to the rope by means of hydraulic pressure sufficient to cold flow the steel into all the interstices of the wires and the strands.

Wire rope is perhaps not so hazardous as other pieces of equipment. However, accidents in which wire rope is a factor are not limited to those caused by the failure of the line itself. There are too many cases where wire rope has been either a contributing factor or the actual cause of a very costly accident. Projecting wires are an all too common source of lacerated hands, while improperly applied clips, attachments, or fittings too often permit the failure of a wire rope at its point of connection. In spite of the fact that wire rope does not contribute as heavily to our accident records as other types of equipment, accidents of this kind are of sufficient frequency and severity to warrant the constant attention of every wire rope operator. Guarding sheaves with barriers, keeping the wire rope properly lubricated, insisting upon the employment of the proper sheaves, a more careful selection of wire rope construction and types, and the more painstaking application of attachments will do much toward the elimination of accidents due to wire rope operation.

Trade Literature

Haviside Company, 56 Steuart Street, San Francisco, has recently published a price catalog covering the varied lines of products carried in stock by the firm. The company was established in 1879 in the business of sailmakers and ship riggers, ship chandlers, and has continued since that time to carry a complete stock of equipment needed for marine engine room and deck departments, supplying chains, anchors, cordage, etc.

Port of Vancouver, Washington, the farthest inland seaport on the Columbia River, has recently published its annual review of shipping and facilities with information concerning its transportation and industrial advantages.

Better Marine Bearings

Pacific Coast Metallurgical Research Engineers Furnish Homogeneous Alloys in the Best Combinations of Copper and Lead for All Marine Bearing Conditions

IN the modern steamer or motorship, we have a complex mass of machinery which, for its successful functioning, depends on the efficient and economical operation of many mechanisms. Each of these mechanisms, whether its motion be reciprocating or rotary, is more or less dependent on a bearing or bearings. Many of these mechanisms in long voyages at sea must be in constant use, sometimes under very difficult conditions and sometimes with the safety of the vessel and her passengers, crew, and cargo dependent upon the operation of the machinery. It will therefore be quite obvious that bearings are very important factors in the operation of modern ocean-going vessels.

Naturally, then, the question, "What is the best metal for a given bearing under a given condition?" has had considerable attention from marine engineers. In fact the marine engineering departments of some large ship operating companies, both American and foreign, have consistently tried out various bearing metals and possess large masses of data on this subject. As part of the knowledge gained from these records, it has long been recognized that for many purposes the ideal bearing metal would be the proper combination of copper and lead.

Copper and lead, however, in the ordinary processes of metallurgy do not like each other. They naturally refuse to combine and produce a homogeneous alloy such as is necessary to stand up under hard bearing service. These metals melted together will, on cooling, separate into a layer of copper on top with a very small percentage of lead, and a layer of lead on the bottom with a very small percentage of copper.

Recently the research engineers of the International Metal Sales Company of San Francisco discovered a flux that overcomes this difficulty. Through the use of this flux they are able to produce alloys known as Shaw Metal in five stock grades and two special grades.

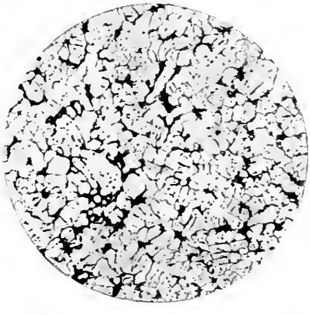
Shaw Metal No. 00 is 85 per cent copper and 15 per cent lead.

Shaw Metal No. 0 is an alloy of 80 per cent copper and 20 per cent lead. This alloy is used for bearings where unusual conditions of loading have to be met, such as dynamometer bearings.

Shaw Metal No. 1 is an alloy of 75 per cent copper and 25 per cent lead by weight. This is the metal recommended for general bearing purposes. It is of homogeneous structure, high compressive strength, and of sufficient tensile strength to stand up well under all ordinary bearing service. This metal has been under service tests for a period long enough to determine its dependableness and merit. Some motor busses of the California Transit Company, with Shaw Metal No. 1 main engine bearings, have traveled 150,000 miles without replacement of a bearing. This alloy is being used in the Hall-Scott marine type gasoline engine and shows excellent service records in that high class motor.

Shaw Metal No. 2 is 65 per cent copper and 35 per cent lead.

Shaw Metal No. 3 is 50 per cent copper and 50 per cent lead. This alloy is an ideal combination for valve seats and metallic packing. It is not affected by any heat obtainable through mechanical friction. As a properly fitted valve seat, it will not leak under any conditions of hot oil or superheated steam. No. 3 can be poured directly with no great mechanical difficulty and lends itself to the production of any practical form of packing.



Micrograph of Shaw bearing metal No. 1 magnified by 100 diameters.

Robert E. Duffy, sales engineer of the International Metal Sales Company, is a former operating marine engineer of considerable ocean experience who is keenly alive to the problems of marine engineering. He knows the kind of service conditions that bearings have to meet at sea and is confident that Shaw Metal can meet and successfully overcome the most difficult of these conditions.

Marine sales of Shaw Metal in the San Francisco Bay district will be handled for the International Metal Sales Company by the Charles E. Low Company.

The Gas Devourer

DURING the past few years a number of disastrous explosions on tankers have emphasized the dangers of hydrocarbon vapors and the necessity of better methods of freeing cargo tank spaces from these vapors before undertaking repair work. Of the many devices patented for this purpose, one of the most recent and most promising is the Gas Devourer, a new form of steam ejector patented by the Rotterdam Dry Dock Company of Rotterdam, Holland.

This ejector is specially designed to deal with large quantities of air and vapor with a minimum consumption of steam. It is designed to be bolted to the discharge branch of the cargo pipe system on deck with a steam connection to the main deck steam pipes. In operation, the suction strum valves on one tank are opened and the small ullage plate on the tank hatch lid is cracked slightly. Steam turned through the ejector causes a powerful flow of vapor from the tank, creating a partial vacuum. This vacuum causes immediate and rapid vaporization of any hydro-carbon oils or their distillates that are still left in the bottom or bilges of the tank. After a few moments of operation, the ullage plate is fully opened and a powerful flow of fresh air results. Air velocities up

to 7700 feet per minute have been measured in suction lines with the ejector going full blast. Experiments with a 10-inch ejector showed a displacement of 3150 cubic feet per minute. Assuming an average tank capacity of approximately 10,000 cubic feet, the tank would have the air changed by this ejector six times in every 20 minutes. In one experiment on a 6600-ton tanker, all the tanks were freed from gas in seven hours, including all work making and breaking connections for the ejector and all work opening and closing suction valves and cleaning in the different tanks.

The entire ejector is solidly built of hard bronze. After the first adjustment it has no moving parts and nothing to get out of order.

Many European tankers have been equipped with the Gas Devourer and in every case the equipment has given entire satisfaction.

The first American tanker to appear on the Pacific Coast with this device was the California Standard. This vessel, designed for the transportation of gasoline from California to western Europe, has two Gas Devourers, one permanently attached to the discharge line to be used in freeing the pump room and the discharge pipes from all gas contents; the other arranged to be attached to suction lines so as to free any tank separately.

A Leakless Globe Valve

A PACIFIC Coast development, the Collar self-grinding idea, has created new standards in valve efficiency and valve maintenance which are being much appreciated by those users of valves who demand dependable service. The principal characteristics of the design of this valve are described in the following paragraphs.

Reversal of the customary arrangement of seat and disc permits a valve opening against and closing with the flow, so that, in the closed position, the line pressure forces the disc against the seat rather than tending to force the seat and disc apart as in ordinary designs.

This construction relieves the packing gland of all pressure when valve is closed and permits repacking or dissembling all but stem and disc when valve is closed under pressure in a one-way line.

After closing and before opening, rotation of the hand wheel one to one and a half turns also rotates the disc an equal amount while in contact with the seat. This grinding or polishing action gives results similar to that obtained by grinding an automobile valve—a ground metal to metal joint; leakless at any pressure or under any conditions. This grinding action is made possible by the introduction of a sliding stem block, through which the stem passes and which slides up and down within the lower portion of the bonnet as the valve is opened and closed.

The stem block operates against a conical spring which prevents any looseness or chattering when the valve is opening. The spring is made from hard drawn Monel spring wire which withstands the higher temperatures without fatigue.

The bottom of the body has a centering point cast in and machined which protects the disc from injury due to contact with the concave portion of the body, and also, acting as a stop when the valve is in a wide-open position, places all the working parts under a tension which eliminates chattering when the valve is placed in a line with a pulsating flow.

These valves are manufactured in a wide variety of materials to suit various working conditions.

The Collar Valve Corporation has worked out a complete system of manufacture for this valve and is now in production on sizes up to 1½ inches. The company manufactures also a leakless self-grinding bibb designed on the same principle as the globe valve. The factory is located in Berkeley, California, where a research department is constantly at work to determine the best possible combinations of metals and alloys to meet any given conditions of valve use and exposure. The experience gained in this experimental work is available in practical advice to users of Collar valves.

The Collar valve is especially adaptable to steam installations where there are extreme temperature changes or extreme throttling conditions. Aboard ship it is used on water column drains, superheater drains, the throttling of steam pumps, steam and oil atomizing, and many other such uses. A number of the Collar valves have been in such use on board ship for over two years with perfect records and still going strong. In addition to the steam valve, a special collar globe valve is in production to take care of oil, air, water, or gas. This is made up from the metal combinations found best adapted to handling this group, and the resultant valve has proved over long periods of service to be leakless even with the lighter distillates and transformer oils.

The engineering organization maintained by the Collar Valve Corporation will gladly cooperate with ship operators in solving their valve problems aboard ship.

Collar leakless globe valves and leakless bibs.

The Kearfott pivoted air port as installed on an American yacht.

New Pivoted Airport

A DEMAND exists for more modern ship fittings than generally have been acceptable to owners and the traveling public. Appearance, safety, simplicity, and ease of operation are expected. This applies especially to those fittings with which passengers come into contact. In the entire range of marine fittings there is no one part to which the foregoing applies more forcefully than to airports. In his stateroom a passenger should be able to open, close, or adjust the ports to suit his convenience. It is not always feasible or convenient to call a steward to do this for him. For our palatial yachts and luxuriously finished passenger liners, pleasing appearance is of paramount importance. Ports must be of a type that will minimize possibilities of accidental closing, and consequent injury to passengers. The operating gear must be so simple and so easy to adjust that the casual traveler will readily comprehend it.

All of these features are embodied in the pivoted type of airport, which the Kearfott Engineering Company, 117 Liberty Street, New York, has recently placed on the market.

These airports are water-tight, are made in standard sizes, both circular and rectangular, and have highly polished bronze frames and fittings. Essentially they consist of a fixed frame, secured to the bulkhead, a vertically pivoted glass in a substantial bronze mounting, and a movable frame for holding the glass in any position from closed to full open.

The working parts, consisting of an annular rack meshing four small pinions on threaded studs, are concealed. A small crank, which offers itself obviously to attention of the passengers as the only means of operation, is located at the lower right hand quadrant. The port is held firmly and effectively water-tight in the closed position by the movable frame. The operation is so simple and easy that a passenger may readily make any adjustment.

Starting with the closed position, the movable frame is brought inward by turning the crank counter clockwise. A small hand grip on the glass frame permits the opening of the port to any desired position. The crank is then turned clockwise until the movable frame grips the glass frame, holding it in position. By reverse operation the port is closed.

Trade Literature

Busch-Sulzer Bros.-Diesel Engine Co., St. Louis, Missouri, has just issued a booklet on the subject of the Busch-Sulzer Type F diesel engine designed to meet the demand for quality diesels in smaller sizes for heavy duty, stationary service—marine direct drive — marine electric drive. The booklet is made up of clear half-tone illustrations and a few diagrams of this type of engine installed and in the workshop —as well as the principal parts, diagrams of general construction, and tables of dimensions. Copy of the booklet will be sent free on request.

Port of Seattle Yearbook — 1929 has been received and is a very beautiful volume. Besides containing the usual port and harbor statistics, the volume, which is printed on fine coated stock and has an attractive artist's color painting reproduction on the cover, contains many illustrations showing the city's advantages and beauties, its fine buildings, parks, and natural attractions, and its growing importance in all forms of industry and transportation—rail, marine and air.

Buyers' Guide to Nickel Alloy Steel Products is a brochure issued by **The International Nickel Company, Inc.**, 67 Wall Street, New York. The guide is limited to those items most frequently inquired for and contains under alphabetical headings the names of manufacturers of nickel alloy steel products such as axles, bars, bearings, etc. Guide is sent free on request.

The Stamford Foundry Company, Stamford, Connecticut, has issued a nice little loose-leaf booklet on **Shipmate Gas Ranges** which should be of interest to builders and prospective owners of small or seagoing cargo vessels of moderate size. The manufacturer states that Shipmate gas ranges are real vessel ranges. The booklet contains a complete list and photographs of all styles and sizes and a description of the fuel, Shipmate gas. The booklet is for free distribution.

Westinghouse Electric & Manufacturing Co. has just issued a finely prepared and printed catalog (No. 250) on **Westinghouse Industrial Electric Heating Apparatus.** The book presents the various types and sizes of Westinghouse industrial electric heating apparatus which have been developed for applications where the successful use of electricity has been proved by industrial practice. Information is given whereby the user can determine just the right equipment for a specific application and can be assured of the proper size, capacity, and operating cost of the equipment. The catalog covers furnaces, ovens, melting pots, industrial heating appliances, industrial heating elements, industrial heating control.

The catalog covers its subject in a very thorough manner, is well illustrated with photographs, graphs, and tables, and may be obtained from any of the Westinghouse offices.

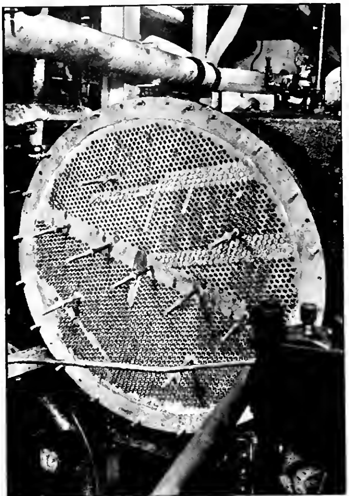
Improvements to a Condenser

CORROSION of condenser tubing is one of the worst enemies to the economical operation of marine steam power plants. This is especially true in modern high pressure plants using turbine prime movers, as in these plants it is very essential to create and hold a high vacuum. Port engineers are therefore constantly studying condenser performance and applying improved methods of tube packing and tube protection.

Through the courtesy of Walter Cox, port engineer of the Associated Oil Company, we are enabled to pass on to our readers an improvement recently effected on the main condenser of the tanker Tulsagas.

This condenser was giving considerable trouble, and, on the occasion of a lay-up for voyage repairs, it was determined to investigate to find the cause. On removing the heads it was apparent that there was very little room for the steam to penetrate into the tube nest and that many of the tubes in way of the steam inlet were badly eroded by steam. Also the inlet ends of many tubes were badly pitted and corroded and the ferrules were so corroded that many of them would crumble when the least pressure was brought into play in unscrewing them from the tube sheet.

It was determined therefore to retube the condenser and to omit enough tubes to allow a sensible passage for the entering steam from its inlet to the center of the tube nest. In the illustration, these steam lanes are plainly shown by the plugs filling the holes in the tube sheet where the tubes were left out. 226 tubes were omitted to make these lanes. In all, 2230 tubes were installed. It will be noticed that this change cuts down the installed heat exchange surface by about 10 per cent. It is thought, however, that this will be more than made up in effective surface by the better distribution of steam over the entire area.



Relaned Condenser on s.s. Tulsagas.

In packing the new tubes, John Crane metallic condenser packing was used, the Associated Oil Company having had very satisfactory service with this packing on a number of its marine power plants. This packing uses no ferrules. The inlet end of all tubes is belled by a special tool so as to minimize turbulence and eliminate air pockets. On the Tulsagas condenser at the inflow end of tubes a fiber bushing was slipped over the tube end and bedded in the threaded bore in tube sheet. A flexible metallic ring was then slipped over tube end and bedded on the fiber ring. The tube end was then belled with a tool made especially for this particular tube sheet. This tool is so proportioned that when the tube has been belled the enlarged diameter at the belled end will just clear the thread in the holes of the tube sheet. The tube is held lengthwise by the forcing of the flexible ring into the thread in the hole. A sharp rap with the tool in the end of the tube will tighten up the packing assembly.

The John Crane special fiber ring is composed of vegetable fibers disposed in such manner that when wet the ring swells radially and tightens the joint between tube and tube sheet.

In retubing this condenser, Scoville Admiralty metal tubes were used, 5/8 inch diameter, 10 feet 2½ inches long, No. 17 Stubbs gauge.

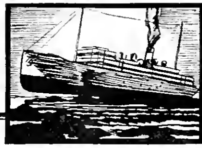
Trade Notes

TO assist shipbuilders, ship owners, and naval architects to select the most suitable equipment for their particular needs, the **Worthington Pump and Machinery Corporation**, Harrison, New Jersey, announces the appointment of Joseph Hecking as special marine representative.

Educated abroad, Mr. Hecking is well qualified both by training and experience for this important work. He has been associated with the American Tinplate Company, the American Sheet and Iron Company, Wm. Cramp and Sons, New York Shipbuilding Company, and Melville & McAlpine. In 1916, Mr. Hecking was appointed chief draftsman in the Bureau of Engineering, Navy Department and, in 1918, he entered the Scientific Department of the American Bureau of Shipping. Subsequently, Mr. Hecking was connected with the Bethlehem Steel Company and also several important engineering undertakings.

Western Engineering Company of San Francisco announces its appointment as exclusive agent in northern and central California for the Consolidated Ashcroft Hancock Company of New York. Western Engineering Company is distributor in this territory for a complete line of marine power plant specialties and marine auxiliary machinery.

Expansion of business and a desire to render more effective service have recently impelled the Western Engineering Company to acquire larger office, display, and storage space at 58 Main Street, San Francisco. At this location, convenient to the waterfront, with stocks of its various lines centralized, and the office, sales, and service units consolidated, Western Engineering will better service its many clients in the Pacific Coast merchant marine.



Marine Insurance

Edited by JAMES A. QUINBY

Trans-Pacific Peanut Case Decided

Poor Stowage Held Cause of Damage to Shipment of 1927 Crop

THE notorious crop of peanuts raised in China in 1926 and shipped to the Pacific Coast in 1927, has furnished notable candidates for judicial attention, but it was not until May 17 last that a case was actually concluded which throws some light on the subject. The opinion in question was handed down by Federal Judge Kerrigan in the case of General Commercial Company vs. American-Hawaiian Steamship Company, and favored the owners and insurers of the peanuts, represented by Derby, Sharp, Quinby & Tweedt, against the vessel owners, represented by Andros, Hengstler & Dorr.

Compensation

When mundane things press in upon my ken
  And all my working days seem occupied
With endless solemn conference where windy words
  Are bartered at a specious valuation,
Or with exact meticulous inspection
  Of fearsome documents whose very names
Conjure the musty breath of counting-houses,
  I fear I am a business man.

But when, through welcome rifts in verbiage
  I hear the measured beating of the surf,
Or in between the lines of printed uselessness,
  I read the protest of some hungry wave
Whose fingers clutched for human lives and failed,
  I breathe salt-laden air, and with the sea
I proudly claim a brotherhood vicarious,
  And am content.

J. A. Q.

Since this is the only opinion on record involving a crop which caused Pacific Coast underwriters many sleepless nights, we deem it worth printing in full.

"This is a libel for damage to a shipment of 500 bags of peanuts. The shipment originated at Chefoo, China, from which port it was forwarded by the Admiral-Oriental Line to Seattle, where it was transshipped to the steamship Virginian of the American-Hawaiian Steamship Company for transportation to New York. When the shipment was examined after delivery at New York it was found to be nearly 20 per cent mouldy, the amount of damage claimed being $1389.93.

The evidence shows that the peanuts were received on the Virginian in good condition. Not only was the shipment in 'apparent good order' with the exception of 6 or 8 slack bags, but there was an actual examination by a commercial chemist, who sampled the shipment after it had been loaded on the ship and subjected the samples to a standard analysis for moisture, finding 8.9 per cent, an amount slightly below the moisture standard fixed by the trade for the 1926 peanut crop. The evidence also shows that on arrival at New York the peanuts showed a moisture content of 9.4 per cent upon analysis, and were 18.8 per cent mouldy. The bags, however, showed no signs of wetting or sweat.

The shipment of peanuts was stowed in No. 2 hold of the Virginian. And the evidence as to the stowage shows negligence, in that lack of dunnage between the peanuts and other cargo prevented air circulation, fostering the growth of mould. There is evidence that another shipment of peanuts in the same hold arrived at its destination free from mould, but in view of the lack of evidence as to the exact method of stowage in No. 2 hold of the latter shipment, no standard of comparison is afforded from which I might conclude that libelant's peanuts moulded on account of inherent vice. I believe that negligent stowage was the cause.

Claimant, in its answer, set up certain bill of lading defenses, based upon a bill of lading alleged to have been issued by it to cover this shipment. No original bills of lading were offered in evidence, but two documents purporting to be copies, one of the through Admiral-Oriental Line bill of lading and the other of the claimant's bill of lading, were offered. Objection was made and sustained to this offer on the ground of insufficient foundation for the use of the secondary evidence. I might say, however, that I have examined the copies of these documents attached to the deposition of H. A. Shook and find that the copy of the document issued by the claimant shows that 'the shipowner by its agent, has signed no bill of lading of this tenor and date.' In other words, the shipment apparently went forward on the Admiral-Oriental Line through bill of lading, the claimant merely issuing what amounted to a memorandum receipt instead of a contract of carriage. The bill of lading defenses pleaded do not refer to the Admiral-Oriental Line bill of lading, but to one issued by claimant. Hence, under the pleadings, irrespective of the question of the admission of the copies of the documents in evidence, claimant has not shown that it issued a bill of lading and cannot prove its bill of lading defenses which are dependent upon a contract with it, by establishing the terms of the contract of carriage entered into with the Admiral-Oriental line by means of the through bill of lading.

Let a decree be entered for libelant with interest and costs."

High Degree of Care Required

The decision clearly shows that a carrier is held to a high degree of care in the stowage and ventilation of shelled peanuts or similar goods. It is further evident that the court takes the view that an excess in the mois-

ture standard of a particular crop does not constitute inherent vice of the commodity. Many underwriters paid losses upon other shipments of this crop, feeling that the damage was due to inherent vice. A reading of the above opinion should justify the payment of such losses, since the inherent vice defense would have received an even more inhospitable welcome in a suit to recover under a marine insurance policy.

Conversion of Foreign Currency in General Average

NEW light upon an old and vexing problem has recently been shed by the Circuit Court of Appeals for the Second (New York) Circuit in the case of the Arkansas, reported in 1929 A.M.C. 581.

The Danish ship Arkansas, carrying a cargo under bills of lading providing for the York-Antwerp Rules of 1890, incurred general average expenditures and sacrifices during a voyage from Norway to Boston. The vessel owner had made the expenditure by purchasing drafts in Denmark, payable in the currency of the place where the accident occurred, and the adjusters brought the purchase price into the adjustment in Danish kroner, and converted them into dollars as of the date of the adjustment.

The respondent, an insurer, refused to pay its contribution so calculated but admitted liability based upon the conversion of the Danish kroner into dollars at the rate of exchange prevailing at the conclusion of the voyage.

The court, after reviewing the cases and sagely observing that there really is no proper time for the conversion, decides that the rate should be that prevailing at the conclusion of the voyage.

End of Voyage Fixes Rate of Exchange

The opinion of Judge Hand reads in part as follows: "It was settled by Hicks vs. Guinness, 260 U.S. 71, certainly after the explanation given in Deutsche Bank vs. Humphrey, 272 U.S. 517, that when a sum is payable in the United States in dollars, any conversion from foreign currency necessary to its calculation is to be made at the exchange prevailing at the due date. The contribution at bar is conceded to have been payable in dollars in the United States, so that the only question is as to when it fell due. If this was at the time when the ship arrived at the port of destination, the decree was right; if at the completion of the adjustment, the adjusters were right.

* * *

We hold that suit may be brought upon the implied obligation at the termination of the venture and acceptance of the goods, and that the amount may be liquidated in the action or suit. The law is familiar enough in actions of tort and in many actions in contract with liabilities which are presently due although unliquidated. With the consistency of the notion we are not concerned; it is enough that the obligor is treated as though presently liable. An average bond may of course change this and make the settlement a condition precedent upon the right of action. Such was apparently the case in Wavertree Steamship Co. vs. Love, L.R. (1897) A.C. 373, though even then it was held that the ship owner might state the adjustment himself. Nor indeed was it decided even in the case of such a bond that no action could be brought as upon an unliquidated claim. However that may be, the record does not advise us of the language used in this bond; we are to take it as a substitute for the consignee's implied obligation. We need only say that unless the contrary appears, the obligation becomes unconditionally due upon acceptance of the goods.

The libelants argue that the only exchange which will make them whole is that of the date of the statement. They have expended kroner and can recoup only by buying the same number with the dollars which they receive as contribution. This is indeed quite true if the owner has had no earlier occasion to convert the disbursement into dollars, but that may often be the case. A master may borrow foreign currency upon a bottomry bond; his sacrifice will be the currency so promised. But the bond may be, and normally will be, payable when the ship arrives, and the owner will be made whole only by the dollars which he then uses to buy the foreign currency in which the loan is payable. The same may be true of any other loan. The owner's convenience or necessity may require for conversion any date between the expenditure and the contribution. To the libellants whose national currency is Danish it naturally appears that exchange at the time of settlement will alone be a recoupment, but this would probably not seem true to an American owner, or indeed to any but a Dane. A priori there is no proper time; the matter must be fixed by some convention which will seem arbitrary to those whose interest it offends and reasonable to those whom it suits.

Same Rule for Sacrifices

The same difficulty crops up as to sacrifices in kind whether by the cargo or the ship. A consignee will ordinarily replace the loss before adjustment and can be made whole only by the money then expended. The Sixteenth Rule fixes the time for cargo as of the ship's

arrival, and while we agree that because of the Eighteenth Rule it is not to be extended by analogy, we assume that the ship's sacrifices would be fixed at the same time. If, for example, a ship pumped out her fuel tanks to lighten herself off a strand, she would normally refill at the nearest port. Only the cost of the replacement then made would make her whole; yet the rule cannot depend upon the varying circumstances of each case. Foreign currency is a commodity like anything else, when one is reckoning in the currency of the forum. Some speculation is inherent in any situation where a man will in the future be called upon to buy a commodity and may choose the moment to do so.

Salvage awards must indeed be an exception, for it will seldom be that they can be made until after the date of ship's arrival, and indeed they will often not be earned until then. But we see no reason to make a single instance the basis of the whole rule. Besides, they will usually be converted into the currency of the adjustment before it is completed, when the owner does his business in that currency. If so, he can be made whole only by the sum which he then pays; to select the date of the adjustment will seem arbitrary. Simplicity and the balance of convenience dictate a single time at which all valuations shall be made. It appears to us that the termination of the venture is the best, and accords with such decisions as have passed upon the subject."

Mixed Cargo

Our lead article on the Virginian peanut case reminds us that the 1926-1927 crop of Chinese nuts has finally run its course, for which cargo underwriters will be duly thankful. With the exception of a stowage case still pending against a Shipping Board vessel and an insurance matter being handled by Bogle, Bogle and Gates in Seattle, the legal horizon has been finally cleared of the clouds of mildew and mutual suspicion engendered by the notorious crop.

It will be recalled that cases against the Isthmian ships Steel Ranger, Steelmaker, and Selma City were compromised. The vessel owners, while asserting that inherent vice was the cause of damage, nevertheless feared a possible deviation.

In a similar manner, underwriters under certain English policies insuring peanuts of the 1927 crop against sweat recently compromised a suit under their policies, filed in San Francisco, by paying a portion of the amount claimed. The underwriters also relied upon the inherent vice defense, but their faith in it was apparently qualified.

One of the best known erstwhile shoreside navigators of San Francisco has recently put to sea. Leb Curtis, of Pillsbury & Curtis, surveyors and marine architects of San Francisco, is on the bridge of the steamer Heber, which his firm has bought to carry lumber to Japan, where she will be scrapped. If you want to hear a good yarn well spun, get Leb to tell you of the time he salvaged the good ship Valkyrie and brought her in from the South Seas.

The San Francisco offices of the Home of New York and the Franklin Fire have moved from their old location at 200 Bush Street to new offices in the Insurance Exchange Building. The marine department occupies the sixth floor.

Breach of Warranty Decides Another Case

IN Scow No. 12, Morrison Mill Company vs. Hartford Fire Insurance Company, reported at 1929 A.M.C. 425, we find an emphatic restatement of the necessity of strict compliance with warranties in a marine policy. The case comes from the United States District Court for the Western District of Washington, where Cosgrove and Terhune successfully defended the insurer, and Bogle, Bogle and Gates represented the assured.

The plaintiff sought to recover under a policy of insurance covering a cargo of box shooks carried on the scow from Anacortes to Seattle. The voyage took place on August 1, 1927, with the tug Columbia having the Number 12 and another scow in tandem tow. The Number 12 commenced leaking shortly after leaving port, and in spite of the efforts of those on the tug to pump her out, became fully submerged while being towed to Port Townsend, the nearest port of refuge.

"The loss to the plaintiff was caused by the submerged condition of the scow. The cargo was salved and the damaged portion disposed of, and recovery is sought for the loss.

The crew of the tug consisted of the master and engineer; the tug was over 100 tons gross. The defendant contends that the policy did not attach because of the tandem tow; that the scow was unseaworthy because the tug began the voyage without a mate; that the scow was unseaworthy because of ancient and improper hatch covers, low coamings, no caulking between the covers and coamings, and no fastenings for the covers themselves; that the scow did not take water because of wind and wave; that it was unseaworthy because

it carried 54 tons of free water. The scow had a 'load' capacity of 268 tons."

As is so often the case, the decision of the court, while favoring the underwriters, is of little value in future cases, as it discusses the various points at issue, and then reaches its result solely on the ground that the tug, having no mate on board was unseaworthy, thus avoiding a warranty of the policy providing that the scow must be towed by an approved tug.

The opinion of Neterer, D. J., reads in part as follows:

"The scow sinking so soon after sailing without having encountered violent storms or other adequate cause created an inference of fact that the cause existed at the time of sailing, and was therefore unseaworthy; and unless this inference of fact is repudiated by the plaintiff, the burden shifts to the plaintiff and releases the defendant of the burden to show that the scow was unseaworthy. (Arnould, Sec. 725).

* * *

I think it must be obvious that the scow was too deep in the water. With a cargo of 250 tons and water in its hold, it was overloaded, and in this condition, and by reason of exposure while moored at the dock the seams opened and on account of the strain in the movement through and depth in the water, caused the scow to fill. Considering all the ascertainable facts, weighing all the evidence, I am persuaded that the inference of unseaworthiness has developed into a presumption of unseaworthiness, and that by a preponderance and weight of the evidence, establishes the unseaworthiness of the scow at the time of sailing. I am not unmindful of the fact that after salving the cargo and the return of the scow, that no impairment was discovered, but the scow had been submerged in the waters of the sea for several days; and it is common knowledge that seams opening under the circumstances could very well close while being submerged.

The tug was within the provisions of the sections, supra, and was required to have a crew of master, engineer and mate, and the fact that the mate quit work shortly before the voyage does not excuse the beginning of the voyage without the mate, since no one was employed in his place. The condition of the policy provided that the scow must be towed by an approved tug. To meet this requirement a full crew — master, engineer, and mate — was necessary. And pronounced is this requirement when scows are towed in tandem. So concluding, it is unnecessary to decide or discuss the other points raised.

An order dismissing the action will be entered on notice."

The Treiber Diesel

THE present trend in diesel engine design runs to higher speeds, moderate pressures, more compact form, and lighter weight. Many interesting and successful commercial diesels have been produced along these lines, both in America and in Europe. Notable among these are the products of the Treiber Diesel Engine Corporation of Camden, New Jersey.

Treiber engineers for fifteen years have been applying the results of up-to-date metallurgical research to the design of light weight, dependable, diesel engines for marine and stationary use and have succeeded in reducing weight and increasing speed without increasing working stresses beyond ordinary practice.

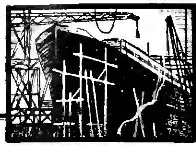
The resultant line of marine diesels is very complete, covering a large range of choice between a 1-cylinder, 7½-kilowatt, diesel generating set and a 12-V-cylinder, directly reversible, marine diesel of 3000 horsepower. Every engine in this line is 4-cycle, solid injection, cold starting and full diesel.

In all of these engines, the combination of high grade aluminum castings for the base, crank case, and piston, best alloy steels for crank shaft, connecting rods, and valves, and nickel iron for cylinder liners, cylinder heads, and water jackets has made possible a very neat light-weight, dependable design.

As an example, the 100-horsepower, 6 cylinder, marine engine with built-in reverse gear has a 5-inch bore, a 7-inch stroke, an over-all height of 45-3/8 inches, an over-all breadth of 27 inches, an over-all length of 84-13/16 inches, and a weight of 2200 pounds. The rated speed of this unit is 1200 revolutions a minute, and the normal fuel consumption is 0.5 pound per brake horsepower hour.

The Treiber 500-horsepower, directly reversible, marine diesel has six cylinders 10½-inch bore by 13-inch stroke and produces its rated power at 700 revolutions a minute. This engine has an over-all height of 79¾ inches, breadth of 39½ inches, and length of 158 inches. It weighs 14,000 pounds.

The 1000-horsepower marine diesel, of 12 V cylinders, has the same bore and stroke as the 500-horsepower engine, is ¼ inch longer, 4½ inches higher, and 3½ inches wider, and weighs 20,000 pounds.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Some Shipbuilding Work in Prospect

Bids for Cruiser Construction Opened by Navy Department

Bids for the construction of the first five of the authorized ten 10,000-ton light cruisers for the United States Navy were opened June 15 at Washington, D.C. Two cruisers are to be built by private shipyards and three by navy yards.

Bethlehem Shipbuilding Corp., Ltd., Fore River Plant, Quincy, Massachusetts, was low bidder of the private yards for the first of the two cruisers, with bid of $10,753,000 for delivery within 36 months.

Newport News Shipbuilding & Drydock Company bid $11,130,000 for delivery of one ship within 36 months on condition that if contracts were forwarded prior to July 1 and the Navy Department limited payments made prior to July 1, 1930 to $1,000,000, delivery would be in 39 months.

New York Shipbuilding Co. bid $10,903,200 for delivery of one cruiser in 36 months.

Bremerton Navy Yard (Washington) submitted low estimate of $8,836,000 for one cruiser;

Mare Island Navy Yard submitted estimate of $9,307,770 for one cruiser;

Philadelphia Navy Yard bid $10,285,906 for one cruiser and $20,000,000 for two;

New York Navy Yard bid $10,508,100 for one and $20,147,603 for two;

Boston Navy Yard submitted offer to build one cruiser in dry-dock, if the engines were purchased, at $11,895,931 or, if the engines were built in the navy yard, $11,943,431. This yard also estimated the cost of building one ship on shipways at $11,948,974 with engines purchased and $11,946.364 if engines were built in yard.

Charleston Navy Yard submitted bid without giving total estimated cost of construction. Norfolk Navy Yard did not bid.

New Fish Patrol Boat

The California Fish and Game Commission is to have a new patrol boat, which has been designed by H. B. Nidever of the control division of the commercial fisheries department at San Pedro, California. Bids will be asked within the next few weeks by the State Purchasing Agent.

The vessel will have a length of 85 feet, 19.5-foot beam, and 9-foot depth. She will be powered with a 250-horsepower diesel engine and is expected to cost approximately $65,000. There will be live bait tanks, provision refrigerator, and other modern conveniences. Quarters will be provided for 12 persons and the crew will number five men. Working plans are to be prepared by a naval architect.

A Pacific Coast-built power plant will be specified in the contract.

New Atlantic Coastwise Vessels Planned

The Eastern Steamship Lines, Inc., of Boston are said to have retained Theodore E. Ferris, naval architect of 30 Church Street, New York, to draw up plans and specifications for the construction of three vessels for its coastwise passenger and freight service. The vessels are to be used in the Boston-St. Johns run in the summer and the Boston-New York run in the winter. The company hopes to have the Post Office Department approve a mail carrying contract to provide added income and to enable the vessels to be built under the special Shipping Board Construction Loan Fund.

New Canadian Freighter To Be Built

The Canada Steamship Lines, Ltd., of Montreal has prepared plans and will construct at Lauzon, Quebec, a canal-size freight motor vessel. She will be 252 feet between perpendiculars, 42 feet breadth, and 14 feet draft. The power plant will consist of a 4-cycle, vertical, 8-cylinder Bessemer diesel engine, 16-inch bore, 22 inch stroke, 800 r.p.m. All pumps are to be electrically operated, power being supplied by three 75-brake horsepower, 4-cycle, 4-cylinder Bessemer diesel engines. Two Sharples centrifuges are specified to take care of the lubricating and fuel oil purification. A 10-kilowatt diesel engine driven generator will supply emergency light.

Shipping Board Loan for Dollar Ships

R. Stanley Dollar, vice-president and general manager of the Dollar Steamship Company, San Francisco, has applied to the Shipping Board for a loan of $45,000,000 from the $250,000,000 construction fund, to pay for the partial cost of the construction of six vessels for the round-the-world service of the company.

Pending the action of a special cabinet committee to consider this loan, the Shipping Board has granted a loan of $1,125,000 for the reconditioning of the present vessels of the company's round-the-world fleet. Of these vessels, the President Adams, President Johnson and President Garfield have already been reconditioned.

Plans for the six new liners call for vessels capable of 20 knots speed to be 650 feet long, 81 feet breadth, 25,000 gross tons, with accommodations for 350 passengers. It is likely that only two vessels will be built at this time, and it is reported that Newport News Shipbuilding & Drydock Company have received tentative order, which is now awaiting approval of plans and loan by the governmental boards.

New Atlantic Coast Vessels Planned

Theodore E. Ferris, 30 Church Street, New York, is the naval architect in charge of plans for a new passenger and freight vessel for the New York & Porto Rico Steamship Company, 25 Broadway,

New York, a subsidiary of the AGWI interests. The vessel will be 429 feet long, 59.5 feet beam, 35 feet depth, of 7057 gross tons. She will have accommodations especially furnished and equipped for cruising in tropical waters and will be powered with geared turbines developing a speed of 16 knots.

This vessel will be a sister ship to the Coamo, built by Newport News in 1925. Her deck machinery will be electrically driven and she will have a large refrigerated cargo space for the carriage of perishables.

Bids Opened on Fisheries Boat

United States Bureau of Fisheries, Smith Building, Seattle, opened bids June 18 for the construction of a patrol cruiser for Alaska service. Bids submitted were as follows:

Ballard Marine Railway Co., Seattle, $89,589;

Lake Washington Shipyards, Seattle, $98,000;

Marine Construction Co., Seattle, $99,750;

J. C. Johnson's Shipyard, Port Blakely, $109,750.

The vessel is to be 130 feet long, 27 feet beam, 17 feet 10 inches depth, the hull to be of Douglas fir and Alaska yellow cedar. She will be powered by a 400-horsepower, 6-cylinder, directly reversible, Union diesel engine and will have accommodations for 32 white men and 24 natives, with cargo capacity for 150 tons. H. C. Hanson, Seattle naval architect, is the designer. This is the second set of bids submitted for the construction of this hull, the first lot having been rejected as too high.

Vessel for Alaska Service

Bids have been submitted for the construction of passenger and cargo vessel for the Seattle-Alaska service of the Alaska Steamship Company of Seattle. Plans call for a length of 420 feet, breadth of 60 feet, and turbo-electric machinery developing 8000 indicated horsepower.

New Ferry Lines Contemplated

Electric Ferries, Inc., of New York, Carroll D. Winslow, president, which has been operating a fleet of six diesel-electric ferries for some time between New York and New Jersey, is reported to be negotiating with the City of New York for the leasing of two ferry lines and the establishment of a new line. The ferry company, according to the report, is to furnish the ships.

Diesel-Electric Towboat for War Department

The U.S. Army Engineers Office, Chattanooga, Tenn., on June 18 will open bids for the construction of a 140-foot steel hull towboat to have diesel-electric power. Fairbanks-Morse & Co. will furnish two 150-brake horsepower diesel engines.

New Derrick Barge for Harbor

Merritt, Chapman & Scott Corporation will build a derrick barge for use in Los Angeles Harbor, within the next six months. The barge is to have a lifting capacity of 90 tons.

The barge will be built at a cost of $125,000, according to C. Lincoln Skolfield, manager of the company at San Pedro, and additional equipment will bring the total cost of the barge and salvage equipment to $250,000.

News from the Shipyards

RECENT CONTRACTS

New York Shipbuilding Co., Camden, New Jersey, has an order from the Erie Railroad for four steel carfloats 366 by 38 by 10 ft. 5 in.; keels of first two were laid May 29.

J. C. Johnson's Shipyard, Port Blakely, Wn., has an order from the Northwestern Fisheries Co., Seattle, for four fish scows, 60 by 18 by 5 ft. 6 in.; also from the Washington Pulp & Paper Co., Seattle, for one 60-ft. service boat.

Midland Barge Co., Midland, Pa., has an order from Treadwell Const. Co. for two steel barges 100 by 26 by 6 ft. 6 in.; also from New York State Canal Comm. for one steel hull 106 by 30 by 7 ft.

Federal Shipbuilding & Drydock Co., Kearny, N.J., has an order from Henry Steers, Inc. for a steel welded barge 116 by 34 ft., 800 D.W.T. capacity; also from O'Brien Bros. for a steel welded barge 120 by 36 ft.; 1200 D.W.T. capacity.

Nashville Bridge Co., Nashville, Tenn., is building four deck barges 130 by 32 by 8 ft.

Martinac Shipbuilding Co., Tacoma, Wash., is building a 72-ft. fishing boat for Dick Suryan of Anacortes. This will be powered with a Washington-Estep diesel engine.

Kruse & Banks Shipbuilding Co., Inc., North Bend, Oregon, is building a 50-foot towboat for the Coos Bay Dredge Co., to be powered with 125-horsepower Atlas-Imperial diesel engine.

Bath Iron Works, Bath, Maine, has an order from Henry J. Gielow, New York, for a twin-screw diesel yacht, 105 L.O.A. to be powered with 2 200-B.H.P. Bessemer diesel engs.; also an order for a twin screw diesel yacht from B. T. Dobson, 125 L.O.A., 2 400-H.P. Winton diesels.

Package Freighter City of Windsor Launched

The Canada Steamship Lines, Ltd., recently launched at its Lauzon, Quebec, yards the package freighter City of Windsor for Great Lakes and rivers service. The vessel is 242 feet long, 24 feet molded depth, 40 feet beam, and is of all steel construction. She has triple expansion, surface condensing steam engines, operating on single screw and two Scotch boilers, to give a loaded speed of 12 miles an hour. The machinery is installed aft, and a special feature of this vessel is steel elevators 15¾ feet by 7¾ feet with capacity for 5 tons, which are installed flush with the tween decks and onto which freight can be trucked directly through gangway door and lowered to the hold with speed and safety. The elevators are operated by a hoisting winch located on deck.

Lightship No. 100, the first of three lightships building by the Albina Marine Iron Works, Portland, Oregon, was launched on June 17.

A bid of $880,000 for the eight steel cargo vessels of the Gulf West Mediterranean Line was received by the Shipping Board June 10 from the Tampa Inter-Ocean Steamship Company of New Orleans, present managing operators of the line. This offer is at the rate of $14 a deadweight ton, the vessels being 7825 deadweight tons each. Sale was approved on this sum by the Shipping Board June 20.

Park & Kibele, San Pedro ship and engine repair firm, has leased the Los Angeles Harbor Department marine ways and land back of it in Wilmington.

Completing a two-year construction program, the fourth vessel for the Inter-Island Steam Navigation

Company of Honolulu was launched June 15 by the Bethlehem Shipbuilding Corp., Ltd., San Francisco.

The Humuula is a combination passenger and cargo carrier, 220 feet long, 38 feet beam, 17 feet depth. She is powered with Westinghouse turbine and Babcock & Wilcox water-tube boiler, and will have a sea speed of 13 knots. She will be fitted with accommodations for 80 passengers and will be equipped to carry cattle on deck, in addition to her general cargo. The Humuula will be ready for delivery the middle of August.

Besides this vessel, the Bethlehem plant delivered the 295-foot first-class passenger and freight steamer Waialeale in June, 1928; a sister ship, the Hualalai, a tug, Eleu, and a pineapple barge in June 1929. This new tonnage puts the Inter-Island Steam Navigation Company in a strong position for the handling of tourist travel as well as general freighting between the islands of Hawaii.

Current American Shipbuilding

On May 1, 1929, American shipyards were building or under contract to build for private shipowners 219 steel vessels of 274,100 gross tons compared with 179 steel vessels of 179,840 gross tons on April 1, 1929, according to the Bureau of Navigation, Department of Commerce.

There were 45 wood vessels of 16,145 gross tons building or under contract to build for private shipowners during the same period compared with 31 wood vessels of 7,495 gross tons on April 1, 1929.

KEEL LAYINGS

Keels for Nos. 21 and 22, diesel-electric cutters for U. S. Coast Guard.

Steel yacht for M. H. Alworth by Defoe Boat & Motor Works, Apr. 15.

Dump scow for Dunbar & Sullivan Dredge Co. by Great Lakes Eng. Works, May 29.

Cargo and oil barge for American Barge Line Co. by Howard Shipyards, May 10; keels for three steel motorboats for U. S. Engineers, May 2, 29, and 31.

Steel cargo barge for Inland Waterways Corp., June 8.

Six deck barges for stock during May and June by Nashville Bridge Co.

Two carfloats for Erie Railroad Co. by New York Shipbuilding Co., May 29.

Beverly, steel tug for U. S. Engineers, Philadelphia, by Chas. Ward Eng. Works, May 4.

Diesel tanker for Sun Oil Co. by Sun Shipbuilding Co., June 5; steel oil barge for Tidewater Oil Co., May 20.

LAUNCHINGS

Humuula, cargo and passenger steamer for Inter-Island Steam Nav. Co. by Bethlehem Shipbuilding Corp., June 10.

Chief Seegay, fish packer for Canadian Fish & Cold Storage Co. by Prince Rupert Drydock & Shipyard, June 6.

Yoreda, steel yacht for Aaron De Roy by Defoe Boat & Motor Works, May 15; Robark, wood yacht for K. T. Keller, June 1.

Dredge hull for Gahagan Const. Co. by Federal Shipbuilding & Drydock Co., June 1.

Lighthouse tender for U. S. Bureau of Lighthouses by Howard Shipyards & Dock Co., May 10.

Six deck barges for stock by Nashville Bridge Co. during May.

Lightship No. 100 for U. S. Lighthouse Service by Albina Marine Iron Works, June 17.

Berwindvale, pulverized coal burning collier for Berwin-White Coal Co. by Bethlehem Shipbuilding Corp., Quincy, Mass, June 8.

DELIVERIES

Hualalai, passenger and freight steamer for Inter-Island Steam Nav. Co. by Bethlehem Shipbuilding Corp., June 1; Eleu, tug for same owner, June 1.

Scow for Northwest Fisheries Co., by J. C. Johnson's Shipyard, May 1.

Five barges to Erector Dept. by American Bridge Co., during May.

Verona J., wood yacht to Albert A. Rose by Defoe Boat & Motor Works, May 5.

Steel dump scow for American Dredging Co. by Dravo Contracting Co.

Diesel-electric dipper dredge for Great Lakes Dredge & Dock Co. by Manitowoc Shipbuilding Corp., June 1.

Midland Prince, converted to self-unloader by Midland Shipbuilding Co., May 27.

Ferryboat for Cheatham County by Nashville Bridge Co., Jan.

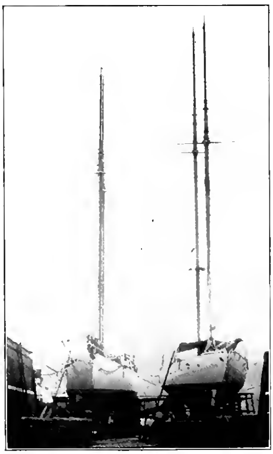
Diesel tug by Nashville Bridge Co., May 10.

Two house barges for Chesapeake & Ohio Rly. Co. by Newport News Shipbuilding & Drydock Co., May 11.

Acania, diesel yacht for A. E. Wheeler by The Pusey & Jones Corp. May 11.

Yorkville, steel ferryboat for City of New York by Todd Drydocks Engineering & Repair Corp., Apr. 5.

Two mooring and fascine barges for U. S. Engineers by The Chas. Ward Eng. Works, May 10 and 25.



Two famous Pacific Coast yachts on the same pontoon at the Los Angeles Shipbuilding & Drydock yard, San Pedro, California. 16ft. bilge blocks were used. Both hulls were scraped and painted. Left, Don Lee's Invader; right, Morgan Adam's Enchantress.

The next year will find more tonnage under construction in American shipyards than at any time since the war period, T. V. O'Connor, chairman of the Shipping Board, declared in Washington recently. Many of these vessels will be of sizes, types, and speeds until recently never undertaken on this side of the Atlantic. Owners have signed agreements to have constructed a total of about 40 vessels, and some of these owners have announced plans to exceed the construction to which they have already agreed.

Formation of a new ocean-going tugboat firm to be known as the Ultican Towing Company was announced the latter part of May by R. J. Ultican of the Ultican Tug Boat Company of Aberdeen, Washington. The company has been incorporated, with an authorized capital stock of $100,000.

An efficient power plant has been ordered from the Washington Iron Works for a former navy tugboat hull recently purchased by Mr. Ultican. This will be a 425-horsepower, 6-cylinder Washington-Estep diesel engine.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of June 1, 1929.

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length over-all; 30' beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28; launched 6/17/29.

Hull No. 113, lightship, sister to above; keel Sept. 1/28; launch July 10/29 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT
Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Hualalai, hull 5336, passenger and freight steamer for Inter-Island Steam Navigation Co., Honolulu; 295 L.B.P.; 27'6" beam; 17'6" loaded draft; 15 knots speed; 1200 D.W.T.; steam turbines; 4000 S.H.P.; 4 W.T. boilers, keel Dec. 17/28; launched Mar. 23/29; delivered June 1/29.

Humuula, hull 5338, steel passenger and freight steamer for Inter-Island Steam Navigation Company, Honolulu, 218'3" L.O.A.; 38' breadth; 17' depth; Westinghouse turbines; 1100 gr. tons; keel April 1/29; launched June 10/29.

Eleu, hull 5339, twin screw diesel tug for Inter-Island Steam Navigation Co., Honolulu; 117 L.O.A.; 28 breadth, 16 depth; keel Jan. 28/29; launched Mar. 21/29; delivered June 1/29.

Hull 5340, barge for Inter-Island Steam Nav. Co., Honolulu; launched Mar. 21/29; deliver May 15/29 est.

Not named, hull 5342, steel tow barge for Shell Co., Los Angeles; 131 L.O.A.; 40 beam; 9'6" draft; 1000 gr. tons; keel June 20/29 est.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A. Wanner.

Unnamed, No. 21, diesel-electric cutter for U.S. Coast Guard; 250x42x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.; keel laid; launch 11/1/29 est.

Unnamed, No. 22, same as above; keel laid.

Unnamed, No. 23, same as above.

J. C. JOHNSON'S SHIPYARD
Port Blakley, Wash.

One K-D. scow for Northwestern Fisheries Co., Seattle; 65 x 22 ft.; delivered 5/1/-29.

Four fish scows for Northwestern Fisheries Co., Seattle; 60x18x5'6".

One 60ft. service boat for Washington Pulp & Paper Co., Seattle.

LAKE WASHINGTON SHIPYARDS,
Houghton, Wn.

Purchasing Agent: A. R. Van Sant.

Foshay, hull 107, steel passenger and freight motorship for Northland Transportation Co., Seattle; 186x35 ft. beam; two 550-H.P. Washington-Estep diesel engs.; keel Mar. 4/29; launch June /29 est.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

Purchasing Agent: C. C. Labric.

Chief Seegay, hull 28, fish packer for Canadian Fish & Cold Storage Co., Prince Rupert, B.C.; 67 L.O.A.; 16'6" beam; 8'8" depth; 50 D.W.T.; 60 B.H.P. Fairbanks-Morse C.O. eng.; keel Mar. 15/29; launched June 6/29.

Ispaco 1, hull 29, pilchard seine boat for Island Packing Co., Victoria, B.C.; 65 L.O.A.; 17'5" beam; 7'8" depth; 75-H.P. Atlas-Imperial diesel eng.; keel Mar. 15/29.

Ispaco II, hull 30, sister to above; keel Mar. 15/29; launch May 23/29 est.

Unnamed, hull 31, steel tug for Canadian National Railways; 90x20x9 (approx. dim.); 360 I.H.P. steam eng., 1 10ft. Scotch boiler.

Hull 32, steel car barge for Canadian National Railways, 184 x 40 x abt. 5 ft.; cap. 8 loaded cars.

Hulls 31 and 32 to be fabricated at yard; then shipped to Kelorona on Okanogan Lake for completion.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Six barges for Erector Dept.; 175 x 26 x 11 ft.; 5 delivered.

Twenty-four cargo barges for Inland Waterways Corp.; 230x45x11 ft.

AMERICAN SHIP BUILDING CO.,
Lorain, Ohio

Purchasing Agent: C. H. Hirsching.

Not named, hull 804, bulk cargo vessel for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft: 12½ mi. speed; T.E. eng. 2200 I.H.P.; 3 Scotch boilers, 14 x 12 ft.; keel Mar. 25/29; launch June 8/29 est.; deliver July 29/29 est.

Not named, hull 805, sister to above; keel Apr. 8/29; launch May 18/29 est.; deliver June 22/29 est.

BATH IRON WORKS
Bath, Maine

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer; keel Dec. 3/28; launch Apr. 10/29 est.; deliver May 1/29 est.

Hi-Es-Maro, hull 123, twin screw steel diesel yacht, Henry J. Gielow, Inc., New York, designer; 266'x35'x22' depth; 14'6" draft; two 1200 B.H.P. Bessemer diesel engs.; keel Nov. 14/28; launch May 8/29 est; deliver July 15/29 est.

Corsair, hull 124, twin screw steel steam turbo-electric yacht; 343x42x27ft., 18 ft. draft; 6000 S.H.P.; General Electric turbo-generators; Babcock & Wilcox boilers; keel June 10/29 est.

Ebb, hull 126, fishing trawler for Bay State Fishing Co., Boston, Mass., Bath Iron Works design; 132'4" L.O.A.; 121'6" L.W.L.; 24 beam; 13 depth; 500-600 B.H.P. Winton diesel engs.

Flow, hull 127, sister to above.

Malaina, hull 128, steel yacht; B. T. Dobson, designer; owner not named; 168 L.B.P.; 26 beam; 9 draft; twin Winton diesel engs.; 1600 I.H.P.

Notre Dame, hull 129, trawler for A. & P. Fish Co., Boston; 116 I.H.P.; 23 beam; 11 loaded draft; single screw; 500 I.H.P. Bessemer diesel eng.

Fordham, hull 130, trawler; sister to above.

Unnamed, hull 131, steel aux. schr. yacht; Henry J. Gielow, designer; owner not named; 150 L.B.P.; 32 beam; single screw; 300 I.H.P. Bessemer diesel eng.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Berwindvale, Hull 1422, single-screw coal collier for Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers; launched June 8/29.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Naushon, hull H-1424, steel passenger and freight steamer for New England Steamship Co., 1800 gro. tons; delivered May 20/29.

Hull 1425, steel coasting vessel for Seaboard Shipping Co.; 450 gr. tons.

Hull 1426, steel barge for Gulf Refining Co.

BETHLEHEM SHIPBUILDING CORP., LTD.,
Baltimore, Md.

Hull 4240, steel 3-track carfloat for Western Maryland Railway; 325 x 38'6" x 10'8".

Hull 4241, same as above.

Hull 4242, same as above.

Hull 4243, steel barge for Western Maryland Rly. Co

Hulls 4244-4251, 8 scows for Arundel Corp.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; Winton engs.; General Electric generators and motors; keel Jan. 30/29 ; launch July 1/29 est.

No. 116, same as above; keel Feb. 6/29; launch Sept. 1/29 est.

No. 117, same as above; keel May 1/29; launch Dec. 1/29 est.

One all-welded tanker for stock.

One all-welded tanker.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Solana, hull 2930, 106 - foot cruiser for W. C. Robinson, Pittsburgh; 2 Speedway diesel engs.; deliver May 15/29 est.

Alida, hull 2936, 75ft. commuter boat for B. H. Borden; 2 300-H.P. Speedway engs.; deliver June 1/29 est.

Redwing, hull 3937, 66ft. day cruiser for G. B. Hoppin; 2 170-H.P. Speedway engs.; deliver July 1/29 est.

Dolphin, hull 2938, 66ft. day cruiser for H. Murray; 2 170 H.P. Speedway engs.; deliver Aug. 1/29 est.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Yoreda, hull 131, steel yacht, for Aaron De Roy, Detroit; 105 L.B.P.; 17 beam; 6 loaded draft; 14 mil. loaded speed; 110 D.W.T.; 250 H.P. diesel eng.; keel Aug. 1/28; **launched May 15/29;** deliver June 1/29 est.

Olive K., hull 133, steel yacht for C. F. Kettering, Detroit; 169 L.B.P.; 26 beam; 12 loaded draft; 15 knots speed; 600 D.W.T.; 1000 I.H.P. diesel engs.; keel Jan. 15/29; launch July 1/29 est.; deliver Aug. 15/29 est.

Verona J, hull 134, wood yacht for Albert A. Rose, Detroit; 75'6" I.H.P.; 14'6" beam; 14' loaded draft; 18 M.P.H.; 70 D.W.T.; 500 H.P. gas eng.; keel Jan. 5/29; **launched and delivered May 5/29.**

Robark, hull 135, wood yacht for K. T. Keller, Detroit; 83 L.B.P.; 15'6" beam; 4'6" loaded draft; 14 M.P.H. speed; 82 D.W.T.; 300 H.P. Winton diesel engs.; keel Feb. 15/29, **launched June 1/29;** delivery July 1/29 est.

Not named, hull 136, steel yacht for A. V. Davis, New York; 138'6" L.B.P.; 18 beam; 5 loaded draft; 20 M.P.H.; 150 D.W.T.; 1400 I.H.P. diesel engs.; keel July 1 29 est.; launch Oct. 1/29 est.; deliver Apr. 15/30 est.

Not named, hull 137, steel yacht for M. H. Alworth, Duluth; 135 L.B.P.; 22 beam; 6'9" draft; 14 M.P.H.; 175 D.W.T.; 600 I.H.P. diesel engs.; **keel Apr. 15/29;** launch Sept. 1/29 est . deliver Nov. 1/29 est.

DRAVO CONTRACTING COMPANY,
Pittsburg, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'6" x 26'6" x 5' 6".

Hulls 811-815 inc.; five steel dump scows for American Dredging Co., Philadelphia; 112 x 34 x 12 ft.; one delivered.

Hull 816, steel oil barge for American Dredging Co., Philadelphia; 100 x 34 x 10'3".

Hull 817, one welded steel barge for stock; 100 x 26 x 6'6".

Hulls 821 to 825 inc.; 5 deck scows for New York Central R.R.; 100'x33'8"x9'7".

Hulls 826 to 829 incl.; 4 1500-cu. yd. dump scows for Geo. H. Breymann & Bros., New York.

Hull 832, steel oil barge for Atlantic, Gulf & Pac. Co., 100x30x 9 ft.

Hull 833, steel floating dry dock for Warner Co., Philadelphia.

Hulls 834-837 inc., 4 merchandise barges for Commercial Transp. Co., Monroe, La.; 130 x 30 x 7'6".

Hulls 838-843 inc., 6 standard sand and gravel barges for stock.

Hulls 858 to 876 incl., 19 standard M.R.C. type steel barges for U.S. Engineers' Office. Memphis; **16 delivered.**

Hulls 877 to 882 incl., 6 standard M.R.C. type steel barges for U.S. Engineers' Office, Memphis.

Hulls 883-892 incl., 10 steel sand and gravel barges for Arundal Corp., Baltimore; 130 x 34 x 8'9".

Hulls 893 to 898 incl., six steel hopper type coal barges for Island Creek Coal Co., Huntington, W. Va.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 109, dredge hull for Gahagan Const. Co., 160 x 40 x 13'6"; keel Mar. 13/29; **launched June 1/29.**

Hull 110, steel welded barge for Henry Steers, Inc.: 116 x 34 ft.; 800 D.W.T.

Hull 111, steel welded barge for O'Brien Bros.: 120 x 36 ft.; 1200 D.W.T.

GREAT LAKES ENGINEERING WORKS,
River Rouge, Michigan

Myron C. Taylor, hull 269, bulk freighter for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12 mi. speed; 12,000 gr. tons; TE engs. 2250 I.H.P. 2 W.T. boilers; keel Mar. 14/29; launch July 6/29 est.; delivery Aug. 1/29 est.

Hull 271, steel dump scow for Dumbar & Sullivan Dredg. Co.: 168 x 40 ft.; **keel 5/29/29;** deliver 7/1/29 est.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1660, lighthouse tender for U.S. Bureau of Lighthouses; 100x30x5'; keel Mar. 11/29; **launched 5/10/29;** deliver 6/16/29 est.

Hull 1677, track barge for Yourtel-Roberts Sand Co., Chester, Ill.; 195x30x6'6".

Hulls 1673-1676, four combination cargo and oil barges for American Barge Line Co., Louisville, Ky.; 150x35x11'; **one keel 5/10/29.**

Houghland, hull 1672, steel hull for towboat for Walter G. Hougland, Bowling Green, Ky. 86x22'x42"; keel 4/2/29; launch 6/10/29 est.

Hulls 1667-1671, five steel motorboats for U.S. Engineers, Vicksburg, Miss.; 30 x 7'6"x2'6"; **3 keels May 23, 29, 31/29.**

Hull 1661, stock towboat; steel; 148x30x 5 ft.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 244, diesel-electric dipper dredge for Great Lakes Dredge & Dock Co.. 156 L.B.P.; 43 beam; 10 ft. draft aft; keel Aug. 30/28; launched Dec. 18/28; **delivered June 1/29.**

City of Saginaw, hull 246, car ferry for Pere Marquette Rail; Co.; 368 L.B.P. 57 beam; 17 loaded draft; 18 m. speed; 2 turbines: 3600 I.H.P. each; 4 Babcock & Wilcox W.T. boilers; keel Mar. 4/29; launch July /29 est.

City of Flint, hull 247, car ferry, sister to above; keel May 1/29.

Reality, hull 248, steel yacht, owner not named; 78 long; 15 beam; 8'9" depth; 6' draft; 150 H.P. Fairbanks - Morse eng.; keel 6/1/29 est.

MIDLAND BARGE COMPANY
Midland, Pa.

Five steel cargo barges for Inland Waterways Corp.; 230x45x11 ft.; **one keel June 8/29.**

Two steel barges for Treadwell Const. Co.; 100x26x6'6".

One steel hull for New York State Canal Comm.; 106x30x7 ft.

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Stadacona, hull 24, bulk freighter for Canada Steamship Lines, Ltd., Montreal; 582 L.B.P.; 60 beam; 20 loaded draft; 11 knots speed; 12,000 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 Scotch boilers; 15'3" dia x 11'6" lg.; keel Apr. 17/29; launch Aug. /29 est.; deliver Sept. /29 est.

Midland Prince, converted to self-unloader; **delivered May 27/29.**

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

W. W. Fischer, hull 169, diesel towboat for Central Sand Co.; 120x26x5½ ft.; 720 I.H.P.; Fairbanks-Morse diesel; keel Feb. 15/29; launch July 1/29 est.

Hull 175, ferryboat, for Cheatham Co.,

Tenn.; gas. eng.; 60x18x2¼ ft.; keel Jan. 2/29; delivered Jan. 15/29.

Hull 177, tug, owner not named; Fairbanks-Morse diesel eng.; 50x12 ft.; 150 H.P.; launched May 6/29; delivered 5/10/29.

Hull 178, dredge, 100x36x8 ft.; launched 5/24/29.

Hull 184, deck barge; 180 x 40 x 9½ ft.; keel Feb. 12/29; launched May 1/29.

Hull 185, deck barge; 180 x 40 x 9½ ft.; keel Feb. 21/29; launched May 3/29.

Hull 186, deck barge; 180 x 40 x 9½ ft.; keel Mar. 7/29; launched May 10/29.

Hull 187, deck barge, 110 x 32 x 7¼ ft.; keel Apr. 6/29; launched May 20/29.

Hulls 188-189, two deck barges for stock; 100x24x5 ft.; keels Mar. 21-28/29; launch May 20/29 est.

Hulls 190-191, two deck barges for stock; 75x20x5 ft.; keels Apr. 3-7/29; launch May 15/29 est.

Hull 192, deck barge for stock; 120 x 30x6 ft.; keel Apr. 2/29; launch May 25/29 est.

Hull 193, deck barge for stock; 110 x 28 x 7¼ ft.; keel 4/28/29; launched 5/29/29.

Hulls 194-195, 2 deck barges for stock; 100 x 24 x 5 ft.; keels June 14-19/29 est.

Hull 196, drydock, 42 x 36 x 5 ft.; keel July 1/29 est.

Hulls 197-199 inc., three deck barges; 100x26x6½ ft.; keels June 1-5-10/29.

Hull 200, towboat, owner not named; 56x14x5'6"; keels July 15/29 est.

Hulls 201-4 inc., five deck barges for stock; 130x32x8 ft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Pennsylvania, hull 329, 18 - knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Oct. 15/28; launch July 10/29 est.

City of Elwood, hull 331, diesel conversion for U.S. Shipping Board.

Ward, hull 332, diesel conversion for U.S. Shipping Board.

Hulls 335-336, two house barges for Chesapeake and Ohio Railway Co.: keels Mar. 11/29; launched 5/9/29; delivered 5/11/29.

Not named, hull 337, passenger liner for A.G.W.I. Nav. Co., New York; 508 x 70'9" x 39'; 15,380 tons displ.; 16,000 S.H.P.; 20 knots speed; turbo-elec. drive; keel Aug./29 est.

Not named, hull 338, sister to above; keel Sept. /29 est.

NEW YORK SHIPBUILDING CO.
Camden, N. J.

Purchasing Agent: J. W. Meeker.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; launched Jan. 23/29; deliver July 9/29 est.

Chester, light cruiser CL- 27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; launch 7/3/29 est.; deliver June 13/30 est.

Santa Clara, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'9" beam; 37'5" depth; General Electric turbo-electric machinery; keel Feb. 4/29; launch Sept./29 est.; deliver Apr./30 est.

Hull 390, carfloat for Erie R.R. Co.; 366x38x10'5"; keel 5/29/29; launch July /29 est.; deliver Aug./29 est.

Hull 391, same as above; keel May/29; launch July /29 est.; deliver Aug. /29 est.

Hull 392, same as above.

THE PUSEY & JONES CORP.,
Wilmington, Del.

Purchasing Agent: James Bradford.

Acania, hull 1038, twin screw diesel yacht for Arthur E. Wheeler, New York; 126 L.O.A.; 21'6" beam; 8'6" app. loaded draft; 2 250-B.H.P. diesel engs.; keel Oct. 18/28; launched Jan. 26/29; delivered May 11/29.

Tidewater, hull 1039, oil tanker for Tide Water Oil Co.; 225 L.B.P.; 44 beam; 15'6" loaded draft; 10½ knots speed; 2300 D.W.T.; diesel-electric power; 1000 I.H.P.; keel Jan. 12/29; launched Apr. 23/29; deliver June 20/29 est.

Nakhoda, hull 1040, yacht for Fred J. Fisher, Detroit; 236 L.O.A.; 34 beam; 19 depth; 12'6" draft; 2 1100 H.P. diesel engs.; keel Feb. 12/29; launch July 20/29 est.

Rene, hull 1041, yacht for Alfred P. Sloan, Jr., New York; same as above; keel Feb. 12/29; deliver Aug. 15/29 est.

Cambriona, hull 1042, yacht for owner not named; same as above; keel Mar. 12/29; launch Aug. 20/29 est.; deliver Sept. 15/29 est.

Not named, hull 1043, twin screw diesel yacht, ordered by Cox & Stevens, Inc., New York; 168'9" long, 28' beam; two 500-B.H.P. diesel eng.; keel June 12/29 est.; deliver Dec. /29 est.

THE SPEAR ENGINEERS, INC.,
Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

John M. Dennis, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.: 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fair-

banks-Morse direct diesel drive; two 450-I.H.P. engs.; keel Feb. 18/28; launched Dec. 15/28; deliver June 13/29 est.

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor, keel Aug. 18/28.

City of Norfolk, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P., keel Feb. 1/29; launch June 1/29 est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Not named, hull 265, steel hull, steam driven, patrol vessel for Supervisors of New York Harbor, 39 Whitehall Street, New York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam; 10'1½" mean draft; T. E. engs.; Babcock & Wilcox W.T. boilers; keel Apr. 6/29; launch 10/12/29 est.; deliver 12/12/29 est.

SUN SHIPBUILDING COMPANY,
Chester, Penn.

Purchasing Agent: H. W. Scott.

Not named, hull 116, passenger and freight motorship for American South African Line, Inc., New York; 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs.; keel Mar. 14/29; launch Sept. 14/29 est.; deliver Nov. 15/29 est.

Blue Sunoco, hull 117, tanker for Sun Oil Co.; 245 L.B.P.; 43 beam; 15'6" loaded draft; 8 knots speed: 2300 Bessemer diesel engs.; keel Jan. 14/29; launched Apr. 6/29; **delivered Apr. 12/29.**

Cayuga Sun, hull 118, oil tank barge for Sun Oil Co.; 188'6" L.B.P., 31' breadth, 11'6" depth; 6000 bbls. capacity on 9ft. draft; diesel-electric propulsion; 2 Bessemer diesels, Westinghouse motors; keel Mar. 11/29; launch June 8/29 est.

Senaca Sun, hull 119, sister to above; keel Mar. 18/29; launch July 15/29 est.

Not named, hull 120, single-screw, diesel tanker for Sun Oil Co., 13,400 D.W.T.; keel 6/5/29; deliver 11/30/29 est.

Unnamed, hull 121, steel oil barge for Tidewater Oil Co., New York; 188'6" x 31' x 11'6"; 6000 bbls. capacity on 9' draft; keel 5/20/29; launch 7/18/29 est.; deliver 8/27/29 est.

TOLEDO SHIPBUILDING CO.,
Toledo, Ohio.

Purchasing Agent. Otto Hall.

Not named, hull 182, fire boat for City of Detroit; 125 L.B.P.; 29 beam; 10 loaded draft; 14 mi. speed; comp. engs.; 950 I.H.P.; 2 B. & W. boilers; deliver Aug./29 est.

TODD DRYDOCK, ENGINEERING & REPAIR CORP.,
Brooklyn, N.Y.

Purchasing Agent. H. J. Shannan.

Yorkville, hull 45, steel double - end ferryboat for City of New York, Dept. of Plant and Structure; 151 L.O.A.; 53 beam over guards; 37'6" molded beam; depth to top of beams 14'3"; draft 8'3"; steam engs.; keel Nov. 1/28; launched Mar. 28/29; **delivered Apr. 5/29.**

UNITED DRY DOCKS, Inc.
Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Dongan Hills, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel June 13/28; launched Mar. 19/29; deliver June 7/29 est.

Pittsburg, hull 784, dredge hull for Atlantic, Gulf & Pacific Co.; 162 L.B.P.; 44 beam; 15 loaded draft; keel Feb. 26/29.

Hull 785, pile driver for City of New York, Dept. Docks; 56x29x7'9"; keel 3/25/29; launch 5/11/29 est.; deliver 6/15/29 est.

Unnamed, hull 790, tug for Standard Transp. Co., New York; 91'6"x22'x10'9"; 12 loaded speed; comp. eng. 500 I.H.P., 1 Scotch boiler 12'6"x11'; keel June 25/29 est.

Unnamed, hull 791, tug, sister to above; keel June 25/29 est.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Hull 77, mooring and fascine barge for U.S. Engineering Office, Memphis; 250 x 26 x 7 ft.; keel Mar. 14/29; **launched and delivered May 10/29.**

Hull 78, same as above; keel Mar. 20/29; **launched and delivered May 25/29.**

Captain George, hull 79, single screw tugboat for U.S. Engineers office, Galveston; 65'6"x17'x7'7½"; 190 B.H.P. Winton diesel eng.; keel Mar. 29/29.

Beverly, hull 80, steel tug, U.S. Engineers, Philadelphia; 65'6"x17'x7'7½" **keel May 4/29.**

Unique, hull 81, yacht for Harold M. Ward, Charleston; 50 x 12 x 4 ft.

Repairs

BETHLEHEM SHIPBUILDING CORPORATION, LTD., Union Plant.

Drydock, clean, paint, misc. repairs: stmrs. Sierra, Grays Harbor, San Carlos, El Segundo, Washington, Horace X. Baxter, H. W. Baxter, Mayfair, Coos Bay Barge No. 2, ferry Gold, Golden State, m.s. Tosca, Hawaiian Standard, Delta Standard, Beulah, yacht Galatea, tug Sea Ranger, fireboats David Scannell, Dennis T. Sullivan. Pipe repairs: Willkeno, Bohemian Club, 1 forged steel tailshaft; F. H. Hillman, Pacific S.S. Co., Daisy (also drydock and paint.) 1 cast iron propeller: stmr. La Perla. Propeller repairs: Frank G. Drum. Misc. repairs: Lio, Doricstar, yacht Volero II. La Placentia, Castor, Caliche, Cepolis, Willboro, Skramstad, Ruth Alexander, Pacific Trader, Varanger, City of Honolulu, Ferncliff, Nordanger, Helen Winmont, Orkanger, yacht, Alpha, Limon, San Mateo, California Standard, Point Fermin, Makura, San Mateo, Solana, Mongolia, Mexican, Point San Pedro, Esparta, Bolivar, La Perla, California, Mana, Point Montar, Wm. Donovan, Daisy Gadsby, Daisy Putnam, Tamalpais.

CHARLESTON DRY DOCK & MACHINE COMPANY,
Charleston, S.C.

General repairs. Sacarappa. New bottom in tender: Palmetto. Oil system in tugboat: Lockwood.

PRINCE RUPERT DRYDOCK & SHIPYARD, Prince Rupert, B.C.

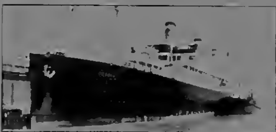
Dock, clean, paint, misc. hull and machinery repairs: 30 fishing boats. Dock, clean, paint, misc. hull repairs: 8 scows. Misc. hull and engine repairs not requiring docking: 44 fishing boats. 105 commercial jobs.

U.S. NAVY YARD, Bremerton, Wn.

Misc. repairs and docking: Idaho, New Mexico, Omaha, Neches, Percival, William Jones. Misc. repairs: Gannet. Misc. repairs incident to operation as district craft: Mahopac, Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.

Who did What
---and How

THE S.S. Concordia recently took delivery of 18 tanks of Shell marine oils at San Pedro. The Chief Engineer of this Norwegian vessel states: "Since using Shell marine engine oil I have reduced the Concordia's oil consumption three liters per day, or nearly one gallon. It is very gratifying to use an oil of such superior quality."



The steamer Resolute, round-the-world liner operated by Hamburg-American, was bunkered from the barge Martinez on her recent one-day stay in San Francisco. Our illustration shows the Martinez supplying the huge liner with Shell fuel oil. This vessel, like many others operated by the Hamburg-American line, takes on Shell oils at the principal ports of the world as she cruises over a route which embraces 33 countries. This route logs 38000 miles on land and sea for the tourist. The barge Martinez has a capacity of 13000 barrels and is capable of pumping 3000 barrels of fuel oil per hour. The Resolute well deserves the title "Queen of Cruising Steamships." It is noteworthy to record that the vessel encounters distinctive climatic changes and for this reason the choice of Shell fuel oil and lubricants is fortunate.

Pictured above is the S.S. Kashu Maru receiving a delivery of Shell marine oil at the Port of Vancouver, B.C. The Kashu Maru is owned by Fukuyo Steamship Company and is operated from Vancouver to Japan. Her engines are steam triple expansion type.

Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

D. Stewart Iglehart, newly elected president of W. R. Grace & Co., New York, was among the first to stake his career on the economic development of South America. He joined the Grace organization twenty-five years ago after graduation from Columbia University and is one of a small group of young men whom W. R. Grace, founder of the company, took under his guidance and trained in all the intricate details of shipping and international finance. Iglehart spent many of the early years of his career on the west coast of South America, where he watched at close hand the beginning of the present era of large industrial expansion and development of natural resources. He studied South America, lived with its people, learned their languages, customs, history, and business methods, and pioneered in a policy of good will that has since been adopted by all companies dealing successfully with South America. Iglehart is a member of an old Maryland family. He succeeds Joseph P. Grace, son of the founder of the organization who becomes chairman of the board of directors.

Latest figures from the Bureau of Navigation show that the port of **San Francisco** ranks second in the ports of the United States for registered gross tonnage, with only New York leading it. Four ports of the country, New York, San Francisco, Cleveland, and Philadelphia, had documented vessels that reached beyond the million mark in gross tonnage. San Francisco had 1,460,758 tons and New York had 5,117,083 tons.

T. E. Rowe, formerly purser on the Dollar liner President Wilson and well known on the Pacific Coast, has been appointed district passenger agent at Naples for the Dollar Line.

Shepard Steamship Company, a new intercoastal steamship line, will be represented on the Pacific Coast by the General Steamship Corporation of San Francisco, according to announcement made at the time of the new line's entry into the trade. The first steamer of the fleet sailing from New York and Philadelphia was the Windrush which left the latter port on June 20 to be followed by the Sagebrush on July 15. Monthly sailings are scheduled by the line.

Ports of call on the Pacific will be Los Angeles, San Francisco, Oakland, Portland, Tacoma, and Seattle. The company will handle general cargo westbound but lumber will be the principal commodity carried eastbound. The Shepard Steamship Company is a subsidiary of the Shepard & Morse, well known Atlantic coast lumber dealers, who also have extensive holdings in the Pacific Northwest.

Whether or not the new line will be affiliated with the intercoastal conference has not been announced. Monthly sailings will be adhered to until such time as there is a demand for more frequent service, when additional tonnage will be added to the line.

A recent visitor to the Pacific Coast was **William Weir,** who, with his brother Andrew, owns the fleet of **Andrew Weir & Co.** of London and Glasgow. Weir said that the days of the slow freight steamer is passing and announced that six new 14-knot freight motorships are being built for the Bank Line for its United Kingdom-California-Orient service.

"Our company has decided that the day of the ten knot steam-driven freighter is passing and that seaborne freight hereafter will be carried by more economical and efficient motorships," he declared. Included in the Weir fleet are twenty-two motorships.

Seeking the aid and cooperation of all sea captains and mariners generally, the **United States Hydrographic Office** has sent out a warning of the necessity of their offices receiving full reports of weather conditions at sea so as to permit checking up on storms to save shipping. This is one of the most im-

Cadets on Panama-Pacific liner California taking instruction in signaling. Left to right: John Bertie, Brooklyn; Stephen Smith, Yonkers; Arthur Sembler, Brooklyn; David Schot, Woodridge, New Jersey; William Topper, Brooklyn; William Willis, New York, all cadets; and Harry Connors, third officer.

McCormick's frequent sailing schedule aids Coastwise shippers

Fourteen separate sailings every week between Pacific Coast ports gives shippers speedy service on Coastwise shipments. McCormick ships dock at McCormick-operated and controlled terminals which are conveniently accessible at all Pacific Coast ports. No shipment too large, nor too small, to receive prompt handling.

With more than 21 vessels plying on regular schedule between Pacific Coast ports, McCormick's Coastwise Line offers excellent facilities, rates and connections to Coastwise shippers.

Your next Shipment via McCormick

McCormick Steamship Company

215 MARKET STREET
SAN FRANCISCO
Davenport-3500

Oakland
Los Angeles
Portland

Tacoma
Seattle
Vancouver, B.C.

COAST TO COAST SERVICE

PANAMA MAIL LEADS

Clocklike regularity and frequent sailings maintained by a fleet of eight modern vessels provide shippers with an unsurpassed service between San Francisco, Havana and New York and a convenient additional local service to Mexico, Central America, Panama and Colombia. Despatch and efficiency have won for the Panama Mail undisputed leadership in freight and passenger transportation in intercoastal service.

Eastbound

Ship	San Francisco	Los Angeles	New York
*S.S. Venezuela	Lv. July 4	Lv. July 6	Ar. Aug. 3
†S.S. Corinto	Lv. July 11	Lv. July 13	....
*S.S. Guatemala	Lv. July 18	Lv. July 20	Ar. Aug. 17
*S.S. El Salvador	Lv. Aug. 1	Lv. Aug. 3	Ar. Aug. 31
‡†M.S. City of San Francisco	Lv. Aug. 8	Lv. Aug. 10	....

Westbound

Ship	New York	Cristobal	San Francisco
†S.S. Corinto	....	Lv. June 15	Ar. July 7
*S.S. Guatemala	Lv. June 13	Lv. June 25	Ar. July 11
*S.S. El Salvador	Lv. June 27	Lv. July 9	Ar. July 25
‡†M.S. City of San Francisco	....	Lv. July 13	Ar. Aug. 3
*S.S. Colombia	Lv. July 11	Lv. July 23	Ar. Aug. 8

†Ports of call—Mazatlan, Manzanillo, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

*Ports of call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Puerto Colombia, Havana (Eastbound only), Cartagena (Westbound only), and New York. ‡Refrigerator Space.

Through Bills of Lading to east and west coast ports of South America and to European ports via New York.

PANAMA MAIL
Steamship Company

San Francisco
2 Pine Street

Los Angeles
548 S. Spring St.

New York
10 Hanover Square

portant functions of the weather bureau which is seeking to bring to the attention of the shipping world just what the service does for them.

A bulletin just issued states that last September the masters of three ships rendered an outstanding public service by sending to the weather bureau its first information of the great West Indian hurricane of that month. Two of these masters were **Captain L. T. Watkins** of the American steamer Commack and **Captain A. O. Oden**, American steamer Clearwater. The name of the master on the British steamer Inanda is not known. It was upon the information furnished by these shipmasters that the weather bureau was able to announce the existence and location of the hurricane, plot its path, and disseminate proper information throughout all threatened territory and save thousands of dollars worth of shipping and many lives.

Tests showing that the United States Navy's new submarine escape apparatus, the "lung," is effective in water pressure at a depth of 300 feet were conducted recently at the Washington Navy yard in the experimental tank for diving, according to an announcement by the Navy Department. Heretofore the tests have been conducted to a depth of only 200 feet both in the tank and under actual conditions at sea.

San Pedro will bid adieu to the old army transport Buford which recently was sold to Japanese interests for scrapping. The vessel recently arrived in the port with 3500 tons of gypsum from San Marcos island. She will complete cargo and sail for Osaka. **Captain A. G. Lauer** will be in command.

Stanley King, who for some time past has been in charge of the Dollar Line headquarters in Chicago, sailed from San Francisco on the President Jackson for Manila where he assumes new duties as traveling passenger agent for the company. This is the first time any steamship company has had a traveling passenger agent in the Philippines, according to Hugh Mackenzie, passenger traffic manager.

During the Pacific Coast visit of **T. L. Duff**, one of Scotland's leading shipowners and operators, he told Vancouver maritime leaders that British shipping interests are rapidly becoming cognizant of the market opportunities on the Pacific Coast. He said that a favorite route today is to operate from Europe to the Orient, with cargo, cross the Pacific with ballast and obtain cargo on the Pacific Coast of Canada and the United States for the home trip.

Sir William Reardon Smith (left) and Captain Robert Dollar, in the offices of the latter at San Francisco, where these two internationally known shipping operators met recently for the first time.

Three new branch offices were opened by the Hamburg-American Line during the past month, one in St. Louis, one in Los Angeles, and one in Seattle. Before the opening of these offices the company was represented in these localities by district passenger agents. **Edwin Gaffron** will be in charge of the St. Louis office, with the title of southwestern passenger manager with territory including Missouri, Southern Illinois, Kansas, Oklahoma, Texas, and Louisiana west of the Mississippi. **William P. Montague** will be in charge of the Los Angeles office with headquarters at 807 South Hill Street. Seattle office will be under the direction of **Paul G. Naef**, who has been connected with the San Francisco office for several years. **E. A. Winkler** is Pacific Coast passenger manager for the company and he has just concluded a tour of Pacific Coast cities in behalf of the Hamburg-American Line.

The famous old bark **Star of Iceland** has been sold by the Alaska Packers Association to Japanese interests and was fitted out at Alameda for the long trip to Nippon.

The Japanese captain and crew which arrived at San Francisco some time ago to sail the bark City of Sydney back to Japan discovered her in an unseaworthy condition. Negotiations were called off and they purchased the Star of Iceland instead. The Star of Iceland was formerly the British bark Willscott. In 1898 she was towed into San Francisco, having been dismasted and seriously damaged, having passed through a typhoon off the China coast.

As the Matson South Seas liner Ventura was homeward bound between Pago-Pago and Hawaii, Captain **Walter I. Green**, second officer of the vessel, succumbed to an illness of only a few days on June 7.

Captain Green, while he never commanded a vessel, held a master's license. The sea called Captain Green when he was a youth of 15 years of age. His father, Captain Charles J. Green, who resides in Alameda, now retired, is one of the best known skippers in coastwise service. Captain Green, Sr., has been shoreside since he left the McCormick coaster Multnomah.

Prior to joining the Ventura, Captain Green sailed on the Matsonia and other vessels of the company's fleet. He was chief officer for several years aboard the Panama Mail liner Colombia with Captain **A. C. Paulsen**, now skipper of the liner Guatemala. He also served as chief officer aboard the transpacific liner President Pierce under Captain **G. T. January**, when the vessel sailed under the old Pacific Mail Steamship Company.

Captain Green's brother, Captain **Charles J. Green**, was a victim of the sea when the steamer Roanoke foundered off the California Coast around 1916.

Captain Walter Green is survived by his widow and two children who reside in Alameda. Along the waterfront of the Pacific Coast, in the Far East and Atlantic Seaboard, as well as in the coastal ports of the Spanish Americas, friends were grieved to learn of the untimely death of the popular officer.

The liner Emma Alexander plys her coastwise course, but **"Benny" Martland,** who has served as chief engineer of the vessel from the time she was cradled, is missing from his post. He died on May 8, just as he was about to stand-by for the signal from the bridge as the vessel was "turning over" for the trip to San Francisco.

"Benny" Martland passed away in the arms of his life-long friend and associate, **Earl Forni,** first assistant, who had served with Martland for sixteen years. Forni had never served another Chief Engineer and upon the latter's passing was appointed to succeed Martland as master of the engine room of the Emma Alexander.

When the keel of the Emma Alexander (ex-Congress) was laid in 1913 at Camden, New Jersey, Martland and Forni stood-by to supervise engine installation. Martland was chief of the Congress when she caught fire off Coos Bay in 1916, and was one of the heroes of that occasion.

San Diego was added as a port of call for the Quaker Line, with the arrival of the freighter Orient from Philadelphia on June 28. **Harold C. Smith,** district manager for Williams, Dimond & Co., announced that all vessels of the line will call at San Diego henceforth. Williams, Dimond & Company have opened offices in San Diego, and the Spreckles Bros. will handle the terminal work, Smith announced.

Los Angeles Harbor interests await eagerly the decision of newly-elected Mayor **John C. Porter** as to whether he would re-appoint **Clinton E. Burge** as harbor commissioner or appoint a new official. Burge's term expires July 1.

Burge has been active since his appointment, and many of his friends hope that he will be retained, as he has been an active supporter of **Walter B. Allen,** president of the Harbor Commissioners. Confirmation of the appointee of the mayor is made by the Los Angeles City Council.

William Jordan, second electrician on the Panama-Pacific liner Virginia.

E. B. Hoppel is chief inspector of the weighing and inspection bureau of the United States Intercoastal Conference which recently started to function in San Francisco. **H. M. Runyon,** Pacific Coast representative, who has charge of the appointment of all the inspectors, declared that the bureau was starting out under auspicious circumstances.

Following the efforts of the Veterans of Foreign Wars, American Legion, and a committee of shipping men led by **Captain A. T. Hunter,** operating manager of the General Steamship Company, and **Walter J. Peterson** of the Marine Service Bureau of San Francisco, **Governor C. C. Young** of California signed the nautical school ship bill passed by the Legislature. The measure calls for an appropriation of $115,000 to support the school. An additional appropriation is secured from federal authorities annually for maintenance of the school ship which will train worthy young men for deck and engine room licenses.

William Cronquist, chief electrician on the Panama Mail Line motorship City of Panama. He is now visiting Sweden on leave of absence, and expects to be married on his return to San Francisco.

The Shell Oil Company's entire sales department in Los Angeles are now located in their beautiful new quarters on the fifth floor of the Washington Building at Third and Spring streets.

C. A. Phelan, who is in charge of the fuel oil sales to ships, has a fine new office in the new headquarters, and the day that the new offices were occupied, Mr. Phelan was busy all day long greeting his friends in the shipping and oil activities of Los Angeles.

Captain **Charles White,** inspector of hulls, and Captain **Savine Craft,** inspector of boilers of the United States Steamboat Inspection Service in Seattle, are back on the job again, having just returned from a water trip of nearly 3000 miles to Alaska.

The two well-known inspectors made the trip aboard the steamer W. M. Tupper to Akutan and from there boarded a Coast Guard cutter and proceeded to Nome and St. Michael.

The ranks of the San Francisco Bar Pilots Association were broken on May 29, when death unexpectedly called Captain **William P. Canty,** one of the most popular and best-known mariners on the Pacific.

Fifty-one years of age and in the best of health until he underwent what was thought only a minor operation, and following which he was reported well on the way to recovery, the untimely death of Captain Canty was a shock to his fellow shipmates and hundreds of friends.

Captain Canty was appointed a bar pilot in 1916. His last command was the tanker Catania in the coastwise oil trade. He started his sea career at 14 years of age. Captain Canty planned to retire and take up admirality law when death called him. He is survived by a widow and two children who reside in Oakland.

Bethlehem's Third Annual Golf Tournament

Scores	Winners	Prizes	Donors
Low gross	E. Hall	Silver Cup	J. J. Tynan
Low net	L. K. Siversen	Set of Matched Irons	A. S. Gunn
2nd low net	E. W. Hannay	Set of Matched Woods	Beth. Ship.
3rd low net	Dr. Park	Zipper Bag	Beth. Steel
4th low net	E. F. Essner	Golf Bag	A. E. Foster
5th low net	A. S. Gunn	Cocktail Shaker	L. K. Siversen
6th low net	F. C. Kobely	Golf Shoes	J. T. Greany
7th low net	H. J. Lueck	Golf Balls—1 doz.	R. O. Houghton
Blind bogey	*J. J. Tynan, Jr.	Wooden Cleek	H. E. Gray
Special prize	A. E. Foster	Matched Woods (Bethlehem Standard	Committee

*J. J. Tynan, Sr. and Jr. tied on Blind Bogey. Jr. won in the shake-up.

FOR two successive years the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., has held an annual golf tournament. June 9, last, witnessed the third meet. Thirty players had signed up for the tournament, twenty-eight of whom migrated to Sonoma Mission Inn on Saturday, June 8, for the purpose of familiarizing themselves with the course.

It started to rain about 11 o'clock Saturday night and continued steadily all through the night, so that on Sunday morning it was the practically unanimous thought that the tournament could not be held. However, about 8:30 a break in the sky seemed to indicate a fairly possible chance to continue the program, and about ten minutes before "teeing off" the rain stopped and did not come on again during the play.

There were two absentees — Dr. G. F. Cushman and W. H. E. Usher being unable to be present. This made a total of 28 players—or 7 foursomes, who were arranged as indicated in the list herewith.

The low gross was won by E. Hall; low net by L. K. Siversen. The second low net was tied with an 80 by Hannay, Gunn, Essner, and Dr. Park. The four tied players shook dice for the second, third, and fourth low net prizes respectively. Hannay won second, Dr. Park third, Essner fourth, and Gunn fifth.

Blind bogey was arrived at by putting the ten lowest scores on slips of paper in a hat and having one picked out by Mr. Gunn. The first number drawn was 87. Mr. Tynan and "Buster" were tied for this and they shook dice to determine the winner, Buster being the successful crapshooter. Mr. Foster was awarded the special prize of "Bethlehem Standard" matched woods, with 1/4 dozen balls and 1/12 dozen tees—he being the lowest handicap man of the entire group of players and, turning in the disgraceful score of 104, was considered as being the only one eligible for a prize of that description.

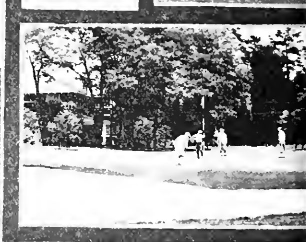
Mr. Foster donated a dozen Silver King golf balls for the low net of those who played Saturday afternoon. This was won by Mr. Hannay, with a gross score of 95, net 81.

Players

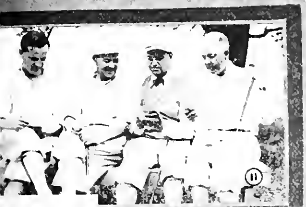
Set	Name	H'cap	Gross Score	Net Score
4	Barrett, Dr. G. M.	20	104	84
2	Cotton	20	115	95
2	Desmond, C. P.	26	116	90
1	Essner, E. F.	18	98	80
7	Farwell, M.	26	157	133
3	Forster, T.	22	123	101
2	Foster, A. E.	12	104	92
7	Gladstone, H. V.	24	129	105
4	Gray, H. E.	14	101	87
3	Greany, J. T.	22	107	85
3	Gunn, A. S.	16	96	80
3	Hall, E.	14	95	81
1	Hannay, E. W.	16	96	80
6	Hooper, T. E.	20	108	88
1	Houghton, R. O.	22	115	93
2	Jurs, P. C.	14	112	98
5	Kobely, F. C.	20	101	81
7	Langton, O.	28	123	95
5	Lennon, H. A.	24	119	95
4	Lueck, H. J.	22	105	83
5	McCune, R.	18	103	85
6	Park, Dr. K. C.	22	102	80
4	Siversen, L. K.	16	95	79
6	Spargo, L.	24	116	92
7	Stevens, E.	20	111	91
1	Tynan, J. J., Sr.	20	107	87
5	Tynan, J. J., Jr.	18	105	87
6	Wharburton, A. N.	24	133	109

BETHLEHEM

1—C. P. Despond, Percy Cotton, Peter Jurs, Arnold Foster.
2—Edwin Hannay, J. J. Tynan, Sr.
3—John Greany, Tom Forster, Edwin Hall, Al Gunn.
4—Edwin Hannay, Eugene Essner, J. J. Tynan, Sr., R. O. Houghton.
5—The Boys with the Bacon!
6—Sonoma Mission Inn Course—still uncharted.
7—Arnold Foster and Bethlehem standard clubs.
8—Ollie Langton—sand, not coal—in bunkers.
9—Al Gunn runs one up.
10—Home green, Sonoma Mission Inn.



TOURNAMENT



11—Herb Leuck, L. K. Siversen, Harold Gray, Dr. Gilbert Barrett.
12—J. J. Tynan, Jr., and Ted Hall, who won low gross.
13—Dr. K. C. Parks, Leland Spargo, A. N. Wharburton, Ed. Hooper.
14—Velvety gaming board.
15—Bethlehem battalion, birdie bound.
16—E. Stevens, Ollie Langton, H. V. Gladstone, M. Farwell.
17—Wharburton warping alongside.
18—J. J. Tynan, Jr., R. McKune, Fred Koberly, H. A. Lennon.
19—Al Gunn's 304 yard screamer.
20—Buster Tynan—no metal mike to guide him!
21—Nature heals all wounds.

San Francisco Propeller Club Launched

Organized by leaders in the marine department of steamship companies and affiliated concerns, official launching of the Propeller Club of San Francisco was heralded with fitting ceremonies at a dinner, Thursday evening, June 20, in the roof garden of the Hotel Whitcomb. More than one hundred and twenty-five leaders of the maritime life of the port were present.

Joseph P. Dolan, United States inspector of hulls and boilers, is the president of the Propeller Club; James A. Cronin, superintendent engineer and naval architect of the Standard Oil Company (Calif.), is chairman of the Board of Governors, and Captain Stanley Allen, of the marine department of the Standard Oil Company is secretary-treasurer.

Chairman Cronin in an opening address to the assembled gathering, comprising engineers, sea captains, and steamship executives afloat and ashore, sounded the key-note of the Propeller Club when he said:

"The purpose of this club is purely social. In general it will be in furtherance of good fellowship, a congregating of old friends and shipmates, both afloat and ashore, where good cheer will hold forth."

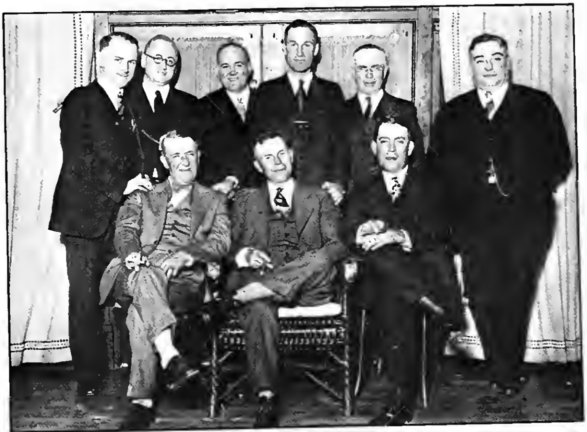
Charles F. Pratt presided as toastmaster, and, under his able direction, a fine program of short talks by executives of the various steamship and other maritime organizations were made, as well as a well-balanced program of entertainment.

Captain Allen reported that the roster showed more than two hundred members already on the membership roll, with applications coming in daily. It is estimated that within three months five hundred members will be enrolled in the organization.

The board of governors' plans underway indicate that within a few months permanent headquarters would be secured. In the meantime meetings are being held in room 1010 of the Santa Fe building.

The officers and Board of Governors of the "Propeller Club" are: Joseph P. Dolan, president; James A. Cronin, chairman of Board of Governors; Captain Stanley E. Allen, secretary-treasurer.

The Board of Governors are: James A. Cronin, chairman, Ray Gunzel, Edward Brady, Captain A. T. Hunter, Fred Cordes, Frank Fox, H. Paladini, Fred McLean, John Parker, Captain G. T. January, V. W. Hoxie, and William Harrower.



A group of officers and governors of the new propeller club of San Francisco. Left to right (standing) Captain Stanley E. Allen, secretary-treasurer; Fred Cordes, Frank Fox, John Parker, Fred McLean, V. W. Hoxie, and (sitting) William Harrower, James A. Cronin, chairman of the board of governors, and Captain G. T. January.

Following is a partial list of the membership:

Stanley E. Allen, Geo. A. Armes.

Jas. Bullock, Joseph Bacciocco, L. J. Baldwin, Henry V. Barbieri, T. Sturgis Barnes, Geo. E. Batten, H. Baxter, W. Luke Biggins, F. W. Blanch, John E. Bolger, H. B. Bolton, R. E. Borchgrevink, R. H. Boyt, Ed Brady, Elmer Butler, A. L. Becker, H. H. Brann, Charlie Blechen.

E. F. Callaher, V. Carroll, J. F. Clements, Wm. Clinton, J. J. Coney, D. J. Conlan, F. Conlan, M. F. Cooper, Fred Cordes, John Cordes, Walter Cox, Philip A. Coxon, H. E. Coyle, J. A. Cronin, Robert Christy, Lew L. Collins, John L. Connelly.

J. L. Davies, Oroville Davis, H. M. Dawsen, Frank H. De Pue, John Dodds, Jos. P. Dolan. Robert Donaldson, P. T. Draper, Berry E. Dunn, Capt. A. A. Dunning, Thos. Dee.

Carl Eber, W. J. Edwards, Edw. B. Egbert, E. F. Essner, Louis Ets-Hokin, W. C. Empey.

Paul Faulkner, W. J. Flannagan, Thos. B. Forster, Alfred Fox, F. Fox, Ben S. Free, Capt. Jas. Fox.

Jas. Gade, H. R. Gelhaus, E. C. Genereaux, R. W. Giddings, Joseph F. Gisler, John T. Greany, Chas. L. Grundell, A. S. Gunn, Ray Gunzel.

Jack Hale, P. N. Harding, Wm. Harrower, Chas. F. Heath, B. Hedstrom, Capt. I. N. Hibbard, M. R. Hickman, Stanley Hiller, J. H. Hind, E. J. Holland, Edward S. Hough, H. E. Hoy, V. W. Hoxie, Capt. A. T. Hunter, Jas. S. Hines.

K. W. Ingraham, Geo. Ingle.

M. H. Jaehne. M. C. Johnson, Albert T. Jones, Gordon E. Jones.

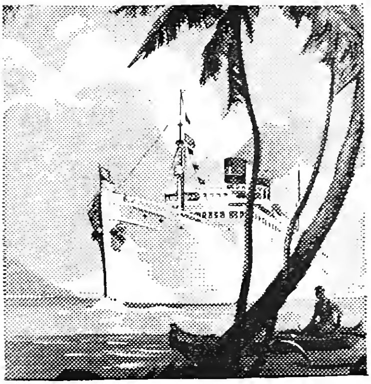
P. F. Keough, Edward D. Keil, A. E. Kihn, M. J. Klein, C. J. Knudsen.

Capt. G. S. Lapraik, W. La France, J. W. Lalor, C. V. Lane, Oliver Langton, Geo. Larson, C. M. LeCount, Capt. B. Lavitvin, Nate Levy, H. W. Lewis, C. A. Lindh, A. E. Lorber.

J. F. McConkey, C. J. McDonald, F. McLean, Dan P. Maher, Abe Marks, W. E. Martin, Capt. E. W. Mason, P. P. Mesquita, N. Micheli, Bernard Mills, R. F. Monges, F. F. Monson, Jos. A. Moore, A. V. Morabito, Vincent Morabito, W. R. Muir, W. Muir, Wm. Macdonald, Sam Mills, Pasquale Marabito, Geo. M. Nave, Carl E. Nordling.

B. J. O'Conner, B. O'Donnell, Jack O'Hare, A. E. O'Leary, M. C. Orrisch, H. Oxsen, E. M. O'Donnell.

Capt. Geo. Pavvesick, Hugo Pala-



dini, John Parker, M. Paulson, Leland Peck, G. E. Pendergast, R. H. Petillion, Charlie Pratt, John J. Presser, C. F. Parker, Russ Pratt.

C. O. Renwick, Walter Richards, C. W. Richardson, Bob Roberts, A. S. Robertson, C. H. Robertson, Jas. B. Rodgers, Geo. G. Rogers, Capt. Jas. Rudden, Capt. J. A. Rumsey.

Captain Arthur Self, Geo. B. Schumer, Frank Schneider, J. R. Selfridge, E. T. Senter, A. A. Short, Thomas Short, Vernon Showell, W. A. Simpson, J. Martin Siversen, L. K. Siversen, Hilmor Smith, Capt. J. Stephenson, J. D. Stigen, R. G. Sullivan, Lon C. Swain, Sam Symon.

H. C. Teasdel, A. A. Tacchella, Julian Theall, Wm. H. Thille, A. V. Thompson, Milton Thwing, A. K. Tichenor, P. B. Trivett, Ed W. Tucker, J. J. Tynan, Jr., J. J. Tynan, Jules J. Thiebaut, H. E. Taumey.

J. P. Van Zance.

G. J. Wandtke, Al Warner, Robt. R. Wells, Geo. F. Williams, E. V. Winter, H. M. Wolters, Frank E. Wulzen.

T. H. Yeager, Jack Young, Jas. Young.

Fred Zimmerling.

Freights, Charters, Sales

May 12, 1929.

THE following steamers have been reported fixed with grain to U.K./Continent: British str. Bradclyde, Portland or Puget Sound, 29/-, option Vancouver 1/3 less, June/July, Kerr, Gifford & Co.; British str. Wentworth, Portland, 29/3, June/July, Balfour, Guthrie & Co.; British stmr. Benholm, Puget Sound, Columbia River, July, Canadian American Shipping Co.; British stmr. Rossington Court, British Columbia, July, Canadian American Shipping Co.

The Danish str. Parana has been fixed with lumber from Columbia River to Melbourne, July, Pacific Transport Co.

The Japanese str. Shiraha Maru has been fixed with lumber from Coos Bay and Columbia River to China, $9, July, Dant & Russell.

The American m.s. Frank Lynch has been fixed with lumber from the North Pacific to Guaymas and Mazatlan, July, Chas. Nelson Co.

The following steamers have been reported fixed with lumber to the Atlantic: American str. Lemuel Burrows, Grays Harbor and Puget Sound to New York and Boston, May/June, Blanchard Lumber Co.; American str. Illingworth, British Columbia to U. S. North of Hatteras, July, Canadian American Shipping Co.

The British str. Benrinnes has been fixed with lumber from Portland to U. K.-Continent, June, W. L. Comyn and Co.

The following time charters are reported: British str. Kalimba, Pacific trade, delivery and redelivery North Hatteras via North Pacific, $1.05, June, Canadian Transport Co.; British str. Sheaf Mead, Pacific trade, delivery and redelivery North Hatteras via North Pacific, $1.15, June, Canadian Transport Co.; German str. Karpfanger, 5 to 7 months, delivery North Pacific, redelivery U. K.-Continent, July, W. L. Comyn & Co.; British str. Portcurno, delivery North Pacific, redelivery U. K.-Continent, July, W. L. Comyn & Co.; British str. Glenbeath, British Columbia to Japan, 2 trips, July, Canadian American Shipping Co.

The following sales are reported: American m.s. Boobyalla, sold to Pacific Salvage Co. (to be dismantled); American barkentine Star of Iceland, Alaska Packers Assn. to Amaksu Gomei Kaisha, Japan; American str. Heber, Pillsbury and Curtis to Japanese parties (to be scrapped).

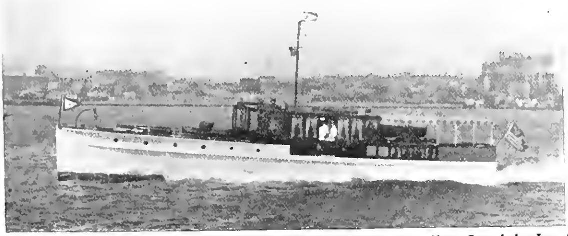
PAGE BROTHERS, Brokers.

Dinner Honors Charles R. Page

A LUNCHEON was given June 20 at the Downtown Association, New York, by the marine underwriters on the Atlantic coast to Charles R. Page, who is retiring as Atlantic Marine Manager of the Fireman's Fund Insurance Company of San Francisco, to take up his executive duties at the head office of the company in San Francisco.

The luncheon was attended by practically every marine underwriter, and, as a compliment to Mr. Page, he was presented with a painting of the bark Arthur Sewall, in which Mr. Page made a voyage to Japan after leaving college. The painting was done by Charles R. Patterson and shows the vessel under reduced canvas running before an increasing gale and sea.

The luncheon was presided over by Hendon Chubb, of Messrs. Chubb & Son; the presentation speech was made by Benjamin Rush, president of the Insurance Company of North America; and Frank H. Cauty, manager of the Thames & Mersey Marine Insurance Company, spoke a few words of appreciation. Following this, Mr. Page replied expressing his regret at leaving New York and his appreciation of the tribute paid. More than fifty of the leading marine insurance men of the Atlantic Coast attended this luncheon.



The Memory, a Herreshoff designed and built cruiser owned by Claus Spreckels, Jr. of San Diego and powered with two Dolphin special, 6-cylinder, Sterling engines.

TRADE NOTE

W. H. Worden & Company, northern California representatives of the Washington Iron Works, manufacturers of the Washington-Estep marine diesel engine, have moved their San Francisco offices and showrooms to new and larger quarters. Their new address is 355 Fremont Street.

The Washington Iron Works is now building several large marine type diesels on order for Pacific Coast workboats.

New Inter-Island Steamer Hualalai

(Continued from Page 273)

Connection between the forward and after portions of telemotor consists of two 3/4-inch copper tubes.

A Hyde steam windlass takes care of the anchor and anchor chains. This is of the spur geared type with two wildcats fitted for 1-15/16 inch stud link chain, each cat having an independent locking gear. The engine is double, 8 by 10 inches, self-contained on the same bed plate as the windlass. Quick warping heads 15 by 20 inches are fitted on the intermediate shaft. All gears, pinions, clutches, wildcats and locking heads are of cast steel. All gear teeth are machine cut with standard involute cutters, and all gearing is fitted with guards. This windlass will handle both anchors and chains simultaneously and will raise one anchor with thirty fathoms of chain out at the rate of 50 feet per minute.

To guard against fire a Rich smoke detection system, furnished by Walter Kidde & Company, through Hough and Egbert, San Francisco agents, is installed in all holds and the paint and lamp lockers, with an indicating cabinet in the pilot house. A Derby fire alarm system (also furnished by Hough and Egbert) protects passengers' and officers' staterooms. Two Warren 12 by 8½ by 12-inch vertical, duplex steam pumps supply water under suitable pressure for the fire mains, and fire hose reels are distributed throughout the ship in suitable locations in accordance with the regulations of the United States Steamboat Inspection Service.

Six pairs of the latest type Steward davits on the boat deck serve five surf boats and a gasoline engine driven launch. These boats were built by George Kneass & Son of San Francisco and the engine of the launch is a Frisco Standard. In addition there are four self-nesting Lundin lifeboats. This equipment will, in an emergency, take care of all passengers and crew. A Cunningham steam boat-hoist located amidships on the boat deck is fitted with extension shaft and gypsy heads to assist in boat handling.

Cargo Handling

We have already alluded to the departure from conventional lines in the arrangement for getting headroom in the automobile storage on this vessel and to the large hatch serving two forward holds. For handling cargo, the Hualalai is provided with five Cunningham steam cargo winches manufactured by Allan Cunningham of Seattle. These have an 8 by 8 inch double steam cylinder wth piston type reversing valve and are of the single drum, single spur geared type. Special attention was given to making these winches quiet-running for this passenger vessel. All gearing is enclosed in oil-tight housings and is arranged to run in a bath of transmission lubricant.

Taken all in all this twin of the Waialeale is in every way worthy of the best traditions of her builders and her owners and we predict that she will greatly increase the popularity of Inter-Island Tours and become a dividend producer like her year old sister.

Direct Philippine Service

MATSON Navigation Company of San Francisco has announced the establishment of a fast direct freight service from Los Angeles and San Francisco to Manila and other Philippine Islands ports.

The transit time will be 23 days from San Francisco, several days less than the fastest service now in operation. Vessels to be placed on this new run are 10,000 ton modern freighters, equipped also for refrigerated cargo, and having a speed of 13 knots. The new service will be inaugurated by steamer Maliko, sailing from San Francisco, July 12; followed by Maunawili on August 9; Maunalei September 6; and every 28 days thereafter.

Outward the vessels will load at Los Angeles and then sail direct from San Francisco to Manila, calling directly at Cebu, Iloilo, and possibly other Philippine ports. On the return voyage, calls will be made at Honolulu.

Several years ago the Matson company operated steamers directly from San Francisco to the Philippines and has felt for some time that there is a pressing need of direct communication and fast freighting service between Pacific Coast parts and Philippine Islands to serve not only importers and exporters on this coast, but also Philippine plantations and business interests. It is expected under the influence of this fast 28-day direct service, business between the ports served will grow rapidly.

The Matson Navigation Company is already one-half owner, with the American-Hawaiian Steamship Company, in the Oceanic and Oriental Navigation Company, now operating freighter services to Philippines and other Oriental ports from San Francisco and Los Angeles.

Two of the Cunningham steam cargo winches on the boat deck of the Hualalai. A considerable quantity of Tubbs Supercore Rope was used on the Hualalai.

Pacific Marine Review

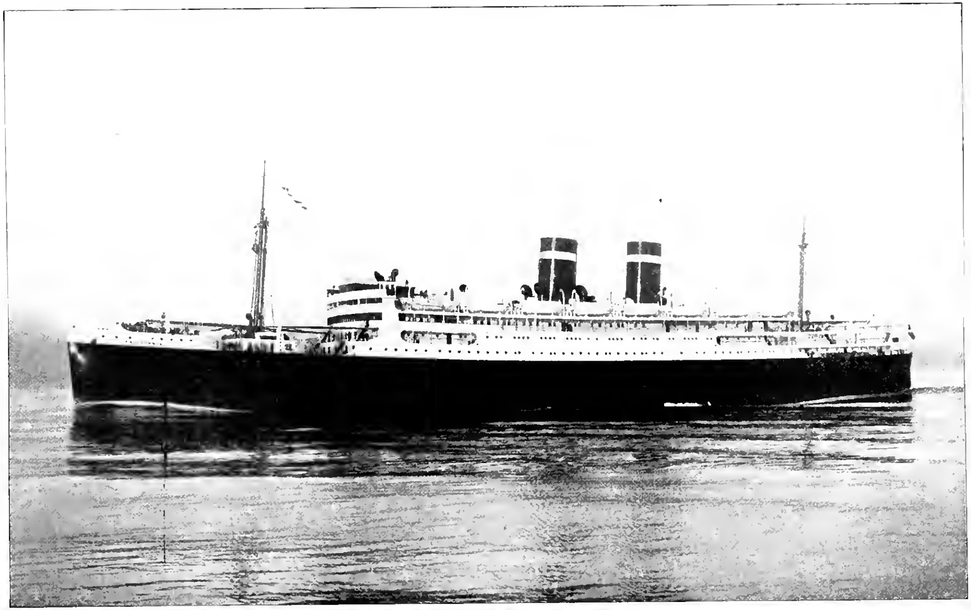
The National Magazine of Shipping

AUGUST, 1929

Official Organ PACIFIC AMERICAN

Official Organ SHIPOWNERS' ASSOCIATION OF THE PACIFIC COAST

Pacific Marine Review, Vol. 26, No. 8, Published Monthly at 576 Sacramento Street, in San Francisco, Entered as second class matter at the post office at San Francisco under the act of March 3, 1879.



The Panama-Pacific Line turbo-electric cargo-passenger liner California. This vessel has set a new standard for comfort and reliability in ocean travel and, with her sisters, the Virginia and the Pennsylvania, has created world-wide interest in turbo-electric propulsion machinery.

(See Page 314)

Pacific Marine Review

Volume 26 San Francisco, Calif. Number 8

An Analysis of United States Shipping

THE National Industrial Conference Board, Inc., an organization supported by the great industries of the United States, has an employed personnel composed of expert economists and analysts whose reports on national problems are taken as standard by American business men and students of national affairs. This conference board has recently completed and printed the findings of their committee on the American merchant marine. Following is a summary and conclusion of this report:

It is generally agreed that the competitive status of American vessels in world trade is unfavorable and that, in the absence of governmental protection and aid, relatively few private American shipowners would survive. It is recognized that it is desirable for the United States to maintain a certain amount of ocean-going shipping facilities for the support of foreign trade. It is likewise recognized that a merchant marine and the shipbuilding industry which it would help to support are both important instruments of national defense.

Beyond this point there are numerous issues in regard to which divergent opinions exist. Should governmental assistance be granted to American ship operators who are not in a position to secure mail contracts? Should the mail contract system be extended to include all of the services now maintained by the United States Shipping Board, provided that those services were sold to private interests? Should the aid now given to shipping be supplemented by subsidies or by some system of preferential treatment for American vessels? These are all controversial questions.

There are two conceptions in regard to the purpose of governmental assistance. On the one hand, it is frequently assumed that government aid should be granted with a view to providing an equivalent of tariff protection in the case of shipping in order to maintain the shipping industries as a part of the industrial activity of the nation. On the basis of this assumption, the construction and operation of shipping might be fostered without special regard to the essential requirements for national defense or for the protection and development of American foreign trade. The other view is that governmental assistance represents an expenditure for the purpose of maintaining as a public utility the shipping needed for foreign trade and national defense and that the amount should not exceed that required to achieve the desired result. It was primarily on this theory that the mail contract system of the Merchant Marine Act of 1928 was established.

Two considerations lead to the acceptance of the latter of these opposing views of the fundamental basis of public policy toward shipping. First, the existing highly competitive condition in the field of world shipping and the world surplus of shipping facilities makes advisable, for the present at least, a policy of specifically determined government aid for the maintenance of an American merchant marine. A large expenditure might be justified to insure the maintenance of the shipping needed for national defense and trade needs, but any policy which resulted in an expansion of facilities beyond actual needs would only serve to intensify competition and to place American ship operators in a still more unsatisfactory position. A second, but less important consideration, is that of the creditor status of the United States in its relations with the leading foreign maritime nations. Since the American protective tariff restricts the ability of the European debtor nations to make payments in goods, foreign services, including shipping, must be accepted as a partial substitute. The present financial and economic position of the United States, and of the world shipping industries, therefore, makes questionable the adoption of any policy which would encourage the development of an American merchant marine larger than that required for national defense and foreign trade and which would to an unreasonable extent lessen the use of foreign shipping services.

The requirements for naval auxiliaries and trained naval personnel from the point of view of national defense are difficult to determine in advance precisely, but in general it is believed that these requirements would be met by shipping facilities ample to care for the demonstrated trade needs of the country. Whatever the particular measures which may be adopted, therefore, future policy should be based upon consideration of the existing deficiencies of American foreign trade shipping, the extent to which American foreign commerce is now carried in American vessels, and the fact that the permanent government ownership or operation of American shipping services is undesirable.

The only distinct advantage which American shipping has over its foreign competitors lies in the possession of a very considerable amount of oil-burning tonnage, an advantage which is at all times contingent upon the relationship between the price of oil and the price of coal. With respect to age and speed, the American merchant fleet is not on a par with the fleets of other countries. There are relatively few old vessels in the American marine, but there are still fewer of recent construction. A large proportion of American ships are low-speed vessels. Moreover, the large number of motorships—a type of vessel in which this country is particularly deficient—which have been added to the mer-

chant fleets of foreign countries in recent years is contributing to increase the relative inferiority of the American merchant marine. The larger part of the American vessels engaged in foreign trade will soon need to be replaced with faster and more modern ships in order to make this merchant fleet an effective instrument of national defense or an efficient agency for the development and protection of foreign trade interests. Some steps in that direction have already been taken as a result of the enactment of the Merchant Marine Act of 1928.

The unsatisfactory competitive position of the shipping operating in foreign trade under the American flag has been largely responsible for the decrease in recent years in the proportion of American commerce carried by American ships. The situation in general is indicative of the competitive weakness of the American merchant marine. This weakness is even more noticeable in the case of passenger traffic in which, due largely to the lack of fast passenger liners, the participation of American shipping is relatively small.

An American merchant marine which was considered adequate from the viewpoint of national defense would probably carry a larger proportion of American commerce than is being carried at the present time. Whether that proportion would reach or exceed fifty per cent., can not be predicted. It would seem more important that the shipping services maintained by private enterprise with government aid should meet well defined needs. If those needs were fully satisfied, the protection of American foreign trade interests would be assured.

Finally, the solution of the American merchant marine problem requires the early withdrawal of the United States Shipping Board from the field of ship operation. Whenever the government engages in business activities, there is necessarily an element of unfair competition. The United States Shipping Board has undoubtedly endeavored to avoid direct competition with private American ship operators, and in recent years has shown itself favorable to the termination of its operating activities. When this termination of operating activities has been accomplished, the remaining problem will be that relating to the disposal of the laid-up fleet. All of the idle government-owned tonnage which is unfit for service might properly be disposed of or at least withdrawn from registry and held for use only in the event of a national emergency. The gradual sale of all the useful vessels, regardless of price but conditioned upon their improvement by the purchaser, would bring to an end the vast expenditures which the continued maintenance of this idle tonnage has entailed.

When a public policy with these objectives in view has been put into effect, the American merchant marine problem will approach solution. The Merchant Marine Act of 1928 may be regarded as a partial recognition of the fundamental basis of a sound policy. The aids provided under that Act are fairly specific in character and are already having a stimulating effect, although the shipbuilding industry is still confronted with serious problems of reorganization and economy required to meet the higher levels of costs which prevail in this country. The method of providing any additional assistance required to maintain essential shipping facilities under the American flag ought to be in accord with the sound business principles which should govern the conduct of governmental affairs as well as those of private enterprise.

American-Hawaiian Head Praises Panama Canal

THE world-wide changes in trade and trade routes which the Panama Canal has effected, and the great aid which this waterway has been to the American merchant marine and to America's domestic and foreign commerce are set forth by President Roger D. Lapham of American-Hawaiian Steamship Company in an article appearing in the July issue of Current History Magazine, New York.

Lapham calls the canal "one of the most majestic and inspiring works ever achieved by man," pointing out, however, that because its opening occurred during the World War, the public gave it no attention until it had been operating so long as to be accepted as commonplace. Nevertheless, "Future generations will regard its opening as significant as that of the first transcontinental railroad."

"Although extremely important from the standpoint of national defense, the great value of the canal lies in its aid to commerce. Seventy years ago we shared honors with Great Britain as mistress of the seas. Today, except for our intercoastal shipping, which depends entirely upon the Canal, we would hold no more than fourth or fifth place. But for the Panama Canal the American merchant marine would have been well-nigh driven from the seas."

The canal's effect on railroad rates is summed up by Lapham in the assertion that for any losses which the railroads may have sustained, they have been "ultimately compensated by new revenues derived from the increased business which the canal produced—new business manufacturers were able to gain because the canal gave them entry to new world markets."

Savings in transportation costs effected by the canal during the last fiscal year amounted to approximately $184,000,000, Lapham states, and asserts that "on the same basis of competition it appears that during the 12 years of its regular operation the Panama Canal has saved the American people at least $1,000,000,000—practically two and one-half times its entire cost."

Launching the Pennsylvania

AT noon, July 10, in the plant of the Newport News Shipbuilding & Dry Dock Company, the turbo-electric liner Pennsylvania was launched. This vessel is the third cargo and passenger vessel built at this yard for the Panama Pacific Line of the International Mercantile Marine Company and, with her sister, the Virginia, shares first place for size among merchant vessels built in American shipyards and among electrically propelled merchant vessels of the world. Each of these vessels is 613 feet long, 80 feet beam, 100 feet depth from upper deck to keel, and has a loaded displacement of 34,000 tons.

Twenty thousand spectators were on hand to witness the launching, among them the Governor of Pennsylvania, the mayors of twelve of the cities of that state, many of the chief shipping executives from New York, and representatives from the many firms supplying materials, machinery, and equipment to the vessel.

All morning the expert launching gangs of the shipyard had been making ready under the vessel, and a few minutes before twelve o'clock the props were all out and the weight of the hull taken up snugly by the

wedges and evenly distributed through the launching cradles and onto the launching ways. Now comes that always dramatic few moments of expectant hush—a hush tinged somewhat with nervousness to the launching gang and to the shipbuilding executives—a hush that in this case has an added element of pure drama.

On the platform at the bow of the ship, surrounded by a small group of notables, stands Eleanor Jane, twelve year old daugher of A. J. McCarthy, general manager of the Panama Pacific Line. All of that crowd who are "in the know" are concentrating their attention on this young lady, for she is about to do something never done before in the history of the world's shipbuilding. At a signal from the executive of the shipyard, Eleanor pronounces firmly into the "Mike" four simple words, "I christen thee Pennsylvania," and without another sound or motion on the part of any spectator or workman that huge mass of steel in front of the young lady glides quietly off the ways and floats proudly on the waters of the James River.

To the electrical engineer this is simply another application of remote control of an electrically operated hydraulic pump through delicate relays. But, Oh, Boy! What a thrill it must have been to Eleanor.

At the luncheon after the launching, P. A. S. Franklin, president of the International Mercantile Marine Company, declared that he "would not be content until we have six steamers like this in service, providing weekly sailings between New York and California ports," and added that the company's building program would be continued by the construction of three more electric liners of the same type as the Pennsylvania.

Marine Equipment and Insurance Rates

RATES for marine insurance, both hull and cargo, are like fire and life insurance rates ashore based on experience of average risks over a period of years. The combined experience of the members of underwriting associations are pooled with those of other underwriting associations, and a basic rate for certain risks is developed. The experience of certain underwriters with certain firms modifies this rate considerably. There is no hard and fast rule by which a shipowner having a certain type of vessel with standard equipment may demand a certain fixed rate. His rate will depend on the experience the underwriters have had with his fleet.

Occasionally we are asked by manufacturers of new equipment of merit why it is that underwriters cannot be persuaded to immediately reduce the insurance rates as soon as they have been certified to the installation of said equipment on the ship. The obvious answer, of course, is that the underwriting associations will reduce the rate if and when, after considerable experience, it has been demonstrated to them that this installation warrants such action. Usually such action is indirect and is reflected in the favorable rate granted to a fleet whose ships are equipped with the apparatus in question and whose officers have consistently used this apparatus to advantage.

Several years ago we were requested by the manufacturer of a well known radio compass to publish an editorial asking reduction of insurance rates on vessels equipped with such apparatus. The editorial elicited no comment whatsoever at the time, but the favorable reaction to our friend's request is just now beginning to percolate through the established channels. The Institute of London Underwriters, Lloyd's Underwriters Association, and the Liverpool Underwriters Association have formally recognized the value of the radio compass by adding to their North American Agreement the following clause: "No additional premium to be charged for vessels calling at St. Johns, New Brunswick, if properly fitted and equipped for the use of wireless direction finding apparatus."

This reduction is of course only a beginning and is naturally applied at the location where radio compass equipment is most needed. As experience demonstrates the usefulness of this and other marine equipment, that experience will eventually be reflected in insurance rates.

Pacific Marine Review Twenty-five Years Ago

HON. J. H. GALLINGER, chairman of the Merchant Marine Commission of Congress, then holding hearings at Seattle, wrote a letter as follows: "Having carefully read a recent issue of Pacific Marine Review, I take pleasure in saying that it is a vigorous and well edited publication which cannot fail to be of great service to the shipping interests of Puget Sound and of the Pacific Coast." Naturally this letter, with Representative Gallinger's portrait, was reproduced very prominently in the then current issue.

This commission held hearings in Tacoma, Seattle, Portland, and San Francisco. The late Winthrop L. Marvin was its secretary, and material developed at the hearings was given very wide publicity at the time.

At Seattle the names of Frank Waterhouse, F. W. Hibbs, James Griffiths, and J. C. Ford stand out prominently among the witnesses. At Portland, W. A. Mears, chairman of the transportation committee of the Portland Chamber of Commerce, contributed some very important points to the discussion. At San Francisco, James J. Rolph, Jr., then president of the Shipowners' Association of the Pacific Coast, spoke strongly against the tax then imposed by California on shipping property. R. P. Schwerin submitted a paper on the handicaps to American operation in the foreign trade which for "thoroughness, range, and knowledge of its subject was one of the most instructive communications received by the commission"; George W. Dickie gave some "elaborate and carefully prepared testimony as to the difference between American and foreign shipbuilding costs."

An editorial suggests the formation of a Pacific Coast Federation of Shipping to combat the "coercive acts of the International Longshoremen's Association of San Francisco."

The August issue reiterates an editorial policy quoting from the first issue: "While Pacific Marine Review is published in Seattle it will be perfectly impartial in its policy toward Portland, Tacoma, Vancouver, Victoria, San Francisco, and other ports on the Pacific Ocean, and will endeavor to fairly represent all shipping interests, and to publish only authentic information on matters pertaining to shipping and transportation."

Exchange the names of Seattle and San Francisco, and the statement still stands as our editorial attitude toward Pacific Ocean ports.

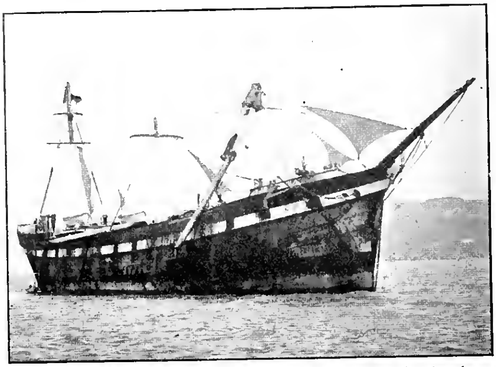
Famous Stars of the Pacific

III. Momentous Career of the Bark Willscott, Later Star of Iceland

By F. C. Matthews

SALE of the bark Star of Iceland to Japanese parties for scrapping brings to mind the early history of the vessel and the many mishaps she had when operating under her original name, Willscott. It did not fall to the lot of many members of the old time sailing fleet, after being repeatedly dismasted and near total destruction, to escape and round out a useful life of over 30 years.

The Willscott was a three-masted steel bark built by W. Hamilton & Company at Port Glasgow, and launched in October, 1896. She was 267 feet long and of 1856 tons net. Her original owners were Hickie, Borman & Company, London. Her first voyage was out to Cape Town, thence in ballast to Philadelphia, and this she accomplished without mishap. Her troubles, however, were soon to begin. Leaving Philadelphia with a cargo of case oil for Hiogo, Japan, she was thrown on beam ends when off the coast of Tasmania and in one heavy squall was in imminent danger of capsizing. The storm was safely weathered, however, and the passage completed.



The British bark Willscott arriving at San Francisco dismasted and under jury rig, April 13, 1898.

On February 3, 1898, she left Hiogo in ballast for British Columbia and, when ten days out, encountered heavy gales which soon developed hurricane force. Snugged down to two lower topsails and two staysails, rolling gunwales under in a high cross sea, the foretopmast buckled and everything above the lower topsail yard fell over forward. This was at 3 p. m. and a moment later the mainmast buckled just below the cheeks and, a few seconds later, again buckled above the deck, all the spars going over the side. The wreckage thumped heavily against the side of the ship and started a slight leak. The next morning at 6 o'clock the spanker boom and gaff, with the mizzen topmast, carried away and the ship lay like a log rolling in the trough of the sea. The storm was at its height and all hands thought every moment would be their last until the gale started to subside a little. It was then found that the bowsprit was still in place, although badly shaken. Lighthouses, forecastle head-rails, ventilators, fife-rail, and ladders were all gone and the deck and covering board were badly damaged. The forward capstan was smashed, two gigs had gone overboard, and the crew's forecastle was damaged. Aft, things were not much better. The mizzen lower mast was badly shaken; poop-rail, skylight, chart house, and ladders were badly smashed; poop and main decks were badly cut up; the bridge and bridge compass were smashed; many chain plates were broken and in one place 48 feet of bulwarks were smashed.

At 10:30 a. m. the British ship Conway, bound for Puget Sound, was sighted but no attention was paid by her to the distress signals flying from the disabled bark.

On February 16, Captain Mitchell managed to get a little sail set but the next day a storm came up and not only blew away the mizzen staysail but also split the spanker badly. After the weather moderated, two stays were set up to the stump of the foremast and the jibs were bent on. Ten days later a spar was gotten across the foremast and a squaresail was set; but four days later another hard blow came on and the mizzen staysail was again lost. Thereafter gale succeeded gale but fortunately all were westerly and a run of from 65 to 70 miles daily was made on the course towards San Francisco, which port Captain Mitchell hoped to be able to make to refit his ship. On April 9, in latitude 39, longitude 127 W., a vessel was sighted which was taken to be either a disabled steamer or a dismasted ship. The Willscott was run down towards her, with signals ready to send up, when a rain squall shut out vision, and after it cleared there was no sign of a vessel.

In San Francisco shipping intelligence, among arrivals of April 13, 1898, is the terse note, "British bark Willscott, Mitchell, 71 days from Kobe, bound for Royal Roads; put in in distress." She had been off Point Reyes all day of the 12th with signals flying but these were not noticed by parties ashore. Later she was picked up by the tug Reliance and towed into port. In the 50 days she was under the makeshift jury rig she had covered about 3500 miles.

Some weeks after her arrival the Willscott was sold to John Rosenfeld's Sons for $35,800. She was repaired and rerigged, continuing as a three-masted bark. The cost of reconditioning not being sufficient to allow her going under the American flag, she was put under that of Hawaii, it being anticipated that she could soon fly the Stars and Stripes. In August, 1900, this privilege was granted, the Islands then becoming a part of the United States.

The first voyage of the Hawaiian bark Willscott was from San Francisco to Nanaimo; thence with coal to Honolulu and back to San Francisco with sugar. She then took grain to Queenstown, making the run in 128

days and returning to San Francisco with coal from Newcastle-on-Tyne in 155 days of light winds.

Captain Thomas Peabody, well known in connection with his former commands, the ships Tam O'Shanter and New York, and in later years master of the U. S. A. T. Sheridan, had the Willscott during this period. The captain was known as the Dude of the American merchant service, a thorough seaman but a very strict disciplinarian. In his report to the San Francisco Merchants Exchange of the passage from Newcastle, after quoting from Coleridge's "Ancient Mariner," he continued in his characteristic style, "On July 11, just north of the line in the Pacific, several sharks were caught and one, nine feet long, was branded with the ship's name and then turned loose. Although the shark was subjected to some rather rough treatment while being dragged on board and had a capstan bar shoved down his throat to keep him quiet while undergoing the process of being branded, he swam off in a very leisurely manner, but no doubt somewhat disgusted at being thrown overboard again. Within an hour the same shark was again under the stern, smelling with evident delight a lump of pork with which a huge hook was baited, but he could not be induced to bite. The sea in the vicinity swarmed with turtles."

On September 25, 1900, the Willscott, under command of Captain Macloon, left San Francisco for Port Arthur with a full cargo of supplies for the Russian Army. After discharging she sailed from Port Arthur, January 11, 1901, in ballast and arrived at San Francisco on March 3. Captain Macloon reported having had heavy rains for the first several days, then strong winds which developed into hard gales, with cold weather and much hail.

On February 4, in latitude 39 N., longitude 76 E., the ship met with a heavy gale with a high cross sea, the ship rolling badly. In one of several squalls of hurricane force, the fore and main topmast heads were carried away, everything attached going by the board, but the hull fortunately escaped material damage. She limped into San Francisco for the second time and was again rerigged. About this period she passed into the ownership of the George W. Hume Company. From this time, March, 1901, until May, 1908, the Willscott was engaged in the general carrying trade. After first making a round trip to Alaska, the Willscott took a full cargo of barley from San Francisco to New York in 124 days. She took case oil from New York to Hong Kong in 1902 and from Philadelphia to Sydney on two occasions, 1905 and 1906. Two cargoes of sugar were taken from Honolulu to eastern refineries and two coal cargoes from New South Wales to San Francisco. In 1903-1904 she had a momentous passage from Philadelphia to San Diego, being 355 days en route. After battling heavy gales off Cape Horn for 67 days, during which she lost fore and main topmast heads, had her rigging badly damaged, and rudderhead sprung, she turned back to Port Stanley, arriving there three weeks later. It was then found that her coal cargo was badly heated and a survey ordered some 500 tons to be discharged. She was in port about 80 days, finally continuing the voyage without her upper spars. On being sighted off the California coast, the revenue cutter Daniel Manning was sent out and towed her to San Diego. She finally reached San Francisco for a third series of repairs on July 29, 1904, then being 367 days out from Philadelphia.

As the bark Willscott, she last arrived at San Francisco May 27, 1908, 124 days from Newcastle, New South Wales, with 3256 tons of coal, her master being Captain Brown, who had been in command for several voyages. There being no dock space available for the discharge of her cargo, she was laid up back of Goat Island. Some months later she was sold to the Alaska Packers Association and notice of the authorization for change of her name to Star of Iceland was received at San Francisco about November 1, 1908.

The American bark Star of Iceland (nee Willscott) casting off the tug outside the heads, San Francisco, July 1, 1929, outward bound on her last voyage. Destination Japanese scrap.

As an active member of the famous "Star" fleet of the Alaska Packers' Association, the Star of Iceland for the past twenty years has regularly made the voyage to the Alaska fishing banks, going up with fishermen, gear, and supplies, and coming home with fishermen and canned salmon and codfish. She had no outstanding records for speed like some of her sisters, but was a consistent, reliable performer. Like the rest of this fleet, she was always kept in first class condition and equipped in shipshape style.

It was no cripple that sailed out through the Golden Gate last month on her way to a Japanese scrap pile in charge of a Japanese crew; but rather a lively old windjammer with plenty of life and strength in her frame, facing seas that have twice done their darndest and failed to put her down.

May her stout steel hull incorporated in many a Nippon skyscraper long continue its good fight against wind and (earth)wave.

Turbo-Electric Drive For Merchant Ships

A Simple Analysis of the Arguments for the Latest Type of Propulsion Machinery

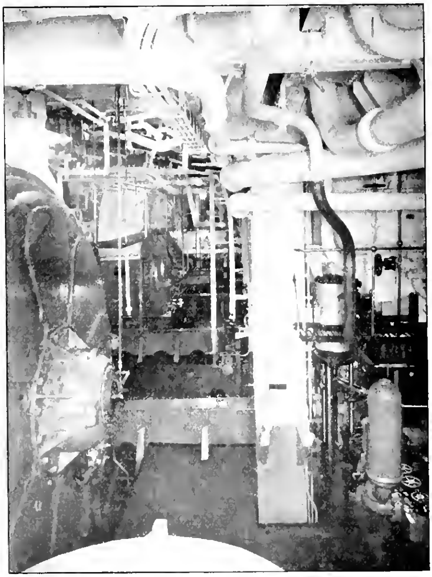
AN excellent article written by H. C. Berrian, assistant chief engineer of Newport News Shipbuilding & Dry Dock Company, analyzing the steam turbine electric drive as applied to merchant vessels was published in a recent issue of the Journal of the American Society of Naval Engineers. The following extract from this article gives, in a very simple and readable fashion, the argument for electric propulsion.

It has only been within the last two or three years that turbine electric drive has been applied on a considerable scale to merchant vessels. The first installation of consequence was the Panama-Pacific vessel California, which was built by the Newport News Shipbuilding and Dry Dock Company, and started her maiden voyage January 28, 1928. This vessel was followed by the Virginia for the same line, which went into service a year later, and will be followed this fall by a third sister vessel, the Pennsylvania. In the meantime, the system has been applied by the British to the Viceroy of India, a vessel of generally similar characteristics and power to the Panama-Pacific vessels above noted.

At the present time several other vessels with a similar type of propelling machinery are under construction in this country, including those for the Grace Line, the Ward Line, and other vessels which are projected.

It is of interest to inquire into the characteristics of this mode of propulsion. In the first place, it is generally conceded that the first cost of turbine electric machinery normally exceeds the cost of geared turbine machinery for similar duty, i.e., power, steam pressure and temperature, vacuum and propeller revolutions. It is the feeling of many marine engineers that the various types of propulsion machinery still have their proper field. The reciprocating engine with moderate steam pressure is still favored for small and moderate powers when fuel consumption is not of first moment and where simplicity and reliability are demanded by the class of operators that are available. The geared turbine with its higher steam pressure and temperature now normally claims the field which is beyond the capacity of the merchant type of reciprocating engine or where fuel economy becomes important. As the power of the geared steam turbine increases it gradually becomes increasingly difficult to provide adequate and reliable reduction gears. Undoubtedly, there is still a field in which either geared turbine or turbo-electric drive would be satisfactory. Just where this point is, it would be difficult for engineers to agree; but in the opinion of many American engineers there is a point when the essential simplicity of the electrical speed reduction provided by the alternating current generator and motor indicates it as being the most reliable method of obtaining that reduction in speed of rotation between turbine and propeller which is necessary to obtain satisfactory efficiency of each. The principles involved in electrical transmission on shipboard are identical with those which have been thoroughly worked out in central station practice and it is quite natural that the United States, which has been the leader in electrical development on land, should be the leader in electrical development on shipboard.

When we come to turbo-electric propulsion, the designer at once finds himself with a free hand in determining the steam conditions that may be used. The single, relatively high speed turbine rotor, constantly revolving in one direction, free from the complications of an astern element with its varying expansions and direction of thrust, has been thoroughly worked out in land practice for pressures and temperatures in excess of anything he will probably care to adopt. The condensers, boilers, and piping are the factors which will determine the pressure and temperature to be employed. The adoption of electric propulsion indicates the use of electricity for most of the auxiliaries, and, as an appreciable amount of current must be supplied for excitation, the size of the auxiliary generators becomes such that condensing rather than noncondensing operation is indicated for them with a correspondingly low water rate. In fact, the water rates that are now obtainable with auxiliary turbo-generators are so low that it is doubtful whether there is any advantage as far as fuel cost is concerned in installing diesel drive generators. Steam for feed heating and similar purposes is obtained simply by bleeding from a suitable stage of the main or auxiliary turbines; which does away with the trouble often encountered with erosion of turbine blades when the flow is in the opposite direction; i.e., when noncondensing auxiliary generators and steam driven auxiliaries are employed and the



excess exhaust not used in the feed heater is returned to a low stage of the main turbine. Bleeding also relieves the low pressure stages at the expense of the high pressure stages, which tends to improve the turbine efficiency.

The following main features must be considered in addition to those already mentioned, when deciding the type of prepelling machinery:

Space

The relative engine room length depends partially on the beam and draft of the ship. The engine room length on the Virginia is about six feet less than would have been required for a geared turbine installation. On other types of vessels this relation may be different. Electric propelling machinery may be arranged to give more head room and greater accessibility. The turbo-generators with the switchboard are usually located one deck level above the inner bottom. This of itself permits the condenser to be placed below the turbines, making the condenser and its accessories more accessible. Further advantages of this arrangement will be pointed out later.

Weight

Turbo-electric is usually heavier than geared drive until extremely high powers are reached. However, that is due partially to two factors which could be eliminated if desired. The geared turbines are usually designed expressly for the job, whereas the electric propelling machinery, due to the production requirements of the manufacturers, frequently covers a wide range of power, the variation between different installations being obtained by comparatively minor changes in the internal construction of the turbines and in the windings of the generators and motors. The auxiliary generating plant is usually made larger than is strictly necessary for the requirements of the main machinery, as the tendency is to electrify all auxiliaries possible, even down to the galley equipment and stateroom heaters. Electrification of auxiliaries is highly advantageous in itself due to better arrangement, greater flexibility, and better economy; but the increased auxiliary generator weight should not be charged primarily to electric drive.

Fuel Economy

Fuel economy is a very prolific subject for argument and often "the wish is father to the thought" when forming an opinion. An impartial study of the operating records would seem to show that there is no appreciable difference between fuel consumption of geared turbine and turbo-electric propelling machinery of the same power, provided the results are corrected to the same steam conditions, the same type of draft, the same combustion air and feed water temperatures, the same vacuum, and the same propeller revolutions, and if the same safety factors for blade stress and vibration are maintained. At present we have no accurate comparative data of similar installations. Most of the service results are in fuel per shaft horsepower per hour; and a slight variation in boiler efficiency will wipe out any difference in turbine efficiency. Suffice it to say that the owners of either type of drive are usually satisfied with the operating results of the decision which they made when selecting the drive at the time the ship was being designed.

It should be noted that owing to the gear teeth and the multiplicity of high speed bearings the geared drive requires from three to four times as much lubricating oil, thus necessitating larger pumps, coolers, tanks, and piping, as well as a higher operating cost for lubricating oil.

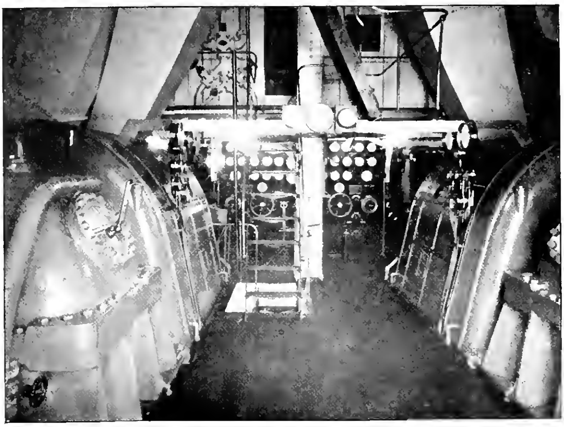
Reliability

The question of reliability has now been settled in so far as electric drive is concerned. With the experience gained in previous installations, the manufacturers are now making their marine propelling machinery just as reliable as their central station units, and the latter need no defense.

Electric drive enjoys one advantage over geared drive from the standpoint of reliability. If one main generating unit is disabled the other main generator can supply current to both propelling motors, giving a speed corresponding to something less than half power or about 70 per cent. It is true that substantially the same result can be obtained with geared drive provided only one of the turbines or pinions is disabled. However, this necessitates the installation of temporary cross over pipes

From the operating engineer's standpoint, one of the great arguments for electric drive is the simplicity and cleanliness of the engine room and the engine control. At the right is shown the operating platform of the Virginia's engine room looking aft between the two General-Electric turbo-generating sets to the main control board. All operations of the propulsion motors shown in the illustration on the facing page and located just below this switchboard on the lower grating of the engine room are regulated by the wheels and levers shown on this board.

This arrangement of the turbines and generators on the upper grating allows the condensers to be fitted directly beneath turbines, eliminating all piping connections and giving the most efficient arrangement similar to that which is always used in large, separate power plants ashore.



(carried for the purpose) or changing from blank to ring flanges to effect the emergency connections. This change-over requires considerable time. With electric drive the change to one generator is simply a matter of switching, involving no delay.

Operation

Engineers capable of operating a geared job have no difficulty in handling the electric installation, although a higher class chief electrician is usually carried. Very little, if any, greater technical knowledge is required.

Furthermore, the control board meters furnish power data at all times. In fact, the engineer on watch knows the power the machinery is developing without making any conscious effort to get it. This knowledge is automatically obtained with ordinary routine operating. How different the occasional trip to the shaft alley to read the torsionmeters on a geared drive installation! If the torsionmeter gets out of adjustment it is very liable to stay that way as shaft horsepower readings are not vital to operation. Knowing the power, the fuel per shaft horsepower can be readily calculated from the oil tank soundings. Faulty operation or defects in machinery, such as excessive shaft bearing friction, damaged propeller blades, poor steering, are readily detected from the power meter readings.

Comfort of Passengers and Crew

From the standpoint of comfort of passengers and crew electric drive has no equal. Vibration is reduced to a point where the critic must search for it. Noise is also reduced to a minimum. The noise of the generator ventilating vanes is low pitched and is not nearly so objectionable as the high pitched tone of some reduction gears. Racing of the propellers is eliminated due to the turbine governor holding down the speed of generator, turbine, and motor.

Auxiliaries

As has been mentioned above, on an electrically propelled vessel the natural tendency is to drive the auxiliaries electrically wherever possible. This is desirable from almost every operating standpoint, but particularly from that of economy. With motor drive each auxiliary, whether large or small, is supplied with current generated by turbo-generators having a water rate of about 20 pounds or less per kilowatt. Assuming an average motor efficiency of 85 per cent the rate per shaft horsepower will be about 32 pounds as against 80 to 120 pounds for the reciprocating type. Of course, with reciprocating auxiliaries the exhaust would be used to heat the feed water, whereas the auxiliary turbo-generators operate condensing at sea as well as in port. However, feed heating is accomplished by bleeding as noted above. Leakage of steam to idle auxiliaries is also eliminated, which further improves the over-all economy. It is often considered advisable to use turbine driven main feed pumps and steam reciprocating fuel oil pumps on account of the simplicity of speed control; and steam reciprocating lubricating oil pumps are generally preferred because of their extreme reliability, which is necessary for the oil operated turbine generators.

The motors driving the auxiliaries are ordinarily direct current, but for the high powered liners of the near future the tendency will be towards the use of alternating current motors wherever a wide range of speed control is not required, as they are of simpler design and require less attention. Propulsion motor ventilation fans, forced draft blowers, main circulating and other pumps, steering gear, galley, lighting, passenger and cargo ventilation fans would use alternating current. The windlass, cargo winches, and boat hoists would ordinarily use direct current supplied by the excitation generators which are idle in port. However, for certain types of ships, alternating current should be used for these also.

Dual Drive

Another method of improving the economy of the auxiliaries is by means of the "dual drive" system. This is used where it is desirable to obtain the highest degree of economy. The auxiliary generating sets are of the three-unit type consisting of a turbine, a direct-current generator, and a synchronous motor. When the vessel is operating above two-thirds speed, current from the main generators is supplied to the motor which drives the direct-current generator. The auxiliaries receive their current from this generator, the voltage of which is kept constant by a voltage regulator, thus obtaining practically the same water rate as the main propelling units. When the main generator speed drops below two-thirds of its normal value, as in maneuvering, the auxiliary turbine automatically picks up the load and drives the auxiliary generator. Numerous variations of this system may be used. When some of the auxiliaries use alternating current they may be supplied direct from the main generators through a transformer. Auxiliary turbine drive must, of course, be provided for speed conditions below two-thirds of normal.

Condensing Plant

As shown by central station practice, the proper place for the condenser is directly underneath the turbine exhaust opening. There are two important reasons for this. First, it furnishes perfect drainage for the turbine without the use of any accessories, such as pumps or injectors. Second, the pressure drop in the long, curved, internally stayed exhaust pipe is eliminated. This means, for the same conditions, an increase in vacuum at the turbine of from 0.25 to 0.5 inch of mercury or a reduction in water rate of from 1½ to 3 per cent. This is particularly valuable where the vessel is operating in hot water.

With a properly drained turbine, high vacuum ejectors and condensate pumps can be used, thereby saving weight, space, cost, and steam and also allowing duplication of apparatus which is not feasible with steam reciprocating air pumps and vacuum augmenters.

A further advantage of air ejectors over air pumps and augmenters is the elimination of air from the feed water. The air extracted from the condensers by the ejectors is vented to the atmosphere, whereas the air removed by the augmenter is carried to the air pump where it is further compressed and an emulsion of air, noncondensable vapors, and water is discharged to the feed tank. From the feed tank it goes to the boilers and unless special deaerating apparatus is installed, corrosion of the boiler tubes is very likely to result.

Terminal Economy and Cargo Management

Announcing a Study on How to Reduce Costs of Handling Cargoes on Marine Terminals

IN the good old days of "wooden ships and iron men"—the days that are still, evidently, regarded as the only appropriate subject for most of our speech-making and much of our writing on maritime subjects—in those days a sea voyage was an adventure and was definitely and legally so classed. The shipments of cargoes by merchants were referred to by those worthies as their "Adventures on the sea" and everything about the ocean and the seafaring life was surrounded with uncertainty and mystery.

In those days, when cargoes were comparatively small and wages very low, an ordinary open wharf or a simple stone quay sufficed for a terminal, and any conveniently sloped sandy beach would pass for a dry-dock. A sailing vessel back home from an overseas voyage of 200 or more days was not expected to be ready for berth next Saturday or to require a per diem penalty on repairs for failure to meet scheduled dates.

Loading and unloading were comparatively leisurely affairs, entirely by hand labor usually on the part of the ship's crew and entirely under the supervision of the mate, who knew every parcel in the hold and in most cases was an expert in rigging tackle, in stowage, in dunnage, and in trimming ship.

With the introduction of power and the gradual improvement and perfection of merchant shipping, the elements of uncertainty and mystery began to disappear and today it may be said of the majority of liner services on the principal trade routes of the world that they run as close to schedule as freight and passenger trains ashore and with about the same specific safety to passengers and cargo.

This movement toward certainty and speed in marine transportation has accelerated remarkably in the past ten years due to the remarkable improvements in fuel economy, making higher speeds possible without too much increase in operating expense, and to the greater safety of navigation made available by modern developments in radio and in sounding apparatus. Much of this speeding up is due also to the modern trend in merchandising toward "small stocks and quick turnover."

In the development of this modern trend in merchant shipping, much work has been done on the ship itself. Naval architects and marine engineers have cooperated to produce that most economical carrier known to man—the modern fast cargo liner. Costs of actual transportation per ton mile at sea are very low, and can by further efforts along well tried lines be made even lower. However, the rate charged for carriage of freight by sea includes the terminal charges and the cost of handling that freight from ship's hold into terminal shed at both ends of the voyage. This item of cost forms a very considerable proportion of the total cost of handling cargoes; in fact, for some trades it is the largest single item of cost, overtopping such items as full cost or wages of crew.

An idea of the relative proportion of terminal costs to other voyage cost items may be had from the following statement of a year's freight earnings expressed in number of days earnings absorbed by each item of the analysis.

(1) Port charges	36 days
(2) Stevedoring costs	115 "
(3) Wages of ship's crew	41 "
(4) Provisions and stores	19 "
(5) Insurance and claims	30 "
(6) Fuel	58 "
(7) Repairs, maintenance, brokerage, and advertising	35 "
(8) Depreciation (5 per cent)	26 "

A total of 360 days, leaving 5 days earnings to apply for management, taxation, and interest on capital. This analysis is taken from the report of the chairman of a typical British steamship line to the shareholders at the annual meeting of 1925.

It is evident that a steamship line studying such report would greatly desire to increase the number of days earnings available for profits and that to do so the number of days applied to other items must be reduced. Items 3, 4, 5, and 8 are hardly reducible by any one line. Item 6 might possibly be reduced 5 to 10 per cent by careful handling of the existing equipment and by better cooperation between the engine room and bridge. This item, of course, might be radically altered by capital expenditures for more modern equipment, but that, while often advisable, changes the whole analysis and we will not consider it here. For our purpose we might, by careful management, get here 2 to 5 days more of freight earnings to take care of overhead and profits. Item 7 might fluctuate quite widely in either direction, according to the circumstances in any one year as compared with another.

It is interesting that items 1 and 2, port charges and stevedoring costs—or, taken together, terminal costs—make up 151 days, or 42 per cent out of the total of 360. We have seen analyses of the costs of operating vessels on certain routes where this percentage runs above 60.

It would naturally seem that the terminal costs are out of all proportion higher than the cost of carrying the freight by sea. Indeed we are constantly hearing from traffic experts such remarks as, "It costs more to move a ton of general cargo over the Hudson River piers than it does to bring that ton from Liverpool to New York," or "We can bring a general cargo from Honolulu to the pier side at San Francisco for less money than we can move it from the hold into the shed." If the above figures are correct, these statements are not far from the truth.

It is evident from these truths that there is something lacking in either the design, the equipment, or the management of marine terminals or in all three, and it would seem that port authorities, engineers, and ship operators ought to get together to supply this lack and make some profits for themselves while speeding up the world's distribution system.

Pacific Marine Review has invited a number of experts in terminal design, ship operation, and cargo management, stevedoring, and terminal safety work to contribute some ideas toward "Better Economy at Marine Terminals" and hopes to establish a clearing house for much valuable, constructive thought and experience on this subject.

Why Dwarf the Waterways?

A Plea for Expansion of Inland Waterways Projects

By Col. Edward C. Harrington, President,
Hudson River Navigation Corporation

GREATER co-ordination between the four principal mediums of transportation—the railroads, the automobile, the airways, and the waterways—is the great objective of those interested in the fulfillment of inland waterways projects in the United States.

The adherents of the waterways are not seeking the business that should go to the railroads or any other form of transportation, but believe that in many instances it is more practical and of more economic benefit to the country to ship by water than by any other way.

Justification for the expansion of the waterways program is shown by the extensive economic benefits derived by the people of the United States in the completion of the Panama Canal and the Mississippi-Warrior River inland waterways projects. The Panama Canal is not only of strategic importance to this country in time of war, but it has been of increasing economic value to the nations of the world ever since it was completed. Long tons of cargo carried in the fiscal year ended June 30, 1915, the first year of its operation, amounted to 4,888,444, while in 1926 tonnage had reached a total of 26,037,448.

When, less than five years ago, the Inland Waterways Corporation was created by an act of Congress, its predecessor, the Inland and Coastwise Waterways service, was losing money at the average of $1,000,000 a year. General T. Q. Ashburn, the corporation's chairman, has just reported to the Secretary of War that the system has paid all its operating expenses, with charges duly made for depreciation and losses incidental to the establishment of the new line, and closed the year of 1928 with a net income from operations of $373,000.

Reflecting the growing use of these facilities by shippers, the tonnage of this system has increased each year since its beginning in 1918, reaching a volume of 1,872,-597 tons in 1928; as the volume grew, the very heavy operating deficits per ton of freight carried which had been incurred in the very early years gradually diminished.

The Mississippi River, from Minneapolis-St. Paul to New Orleans, and the Warrior River service, between Birmingham and Mobile, carry a varied line of commodities. Sugar made up the heaviest tonnage of 1927, but in 1928 yielded first place to bauxite ore. Grain is third on the list and cotton fourth. To the shippers of these and other miscellaneous commodities the controller of the Inland Waterways Corporation estimates that the service saved $2,702,000 in 1928.

Some of the steel manufacturers have already utilized a variety of inland barge services for cutting costs. Among others that are using barges are the automobile plants of Detroit, the rubber factories of Akron, the implement and agricultural machinery makers, and the Chicago packing houses.

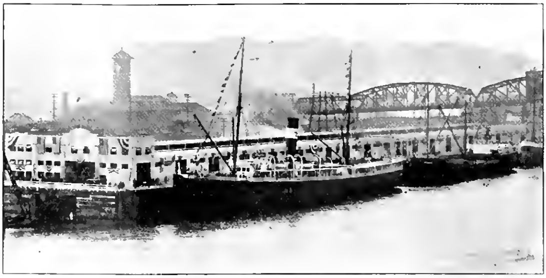
The Great Lakes-Hudson waterways system, I believe, would be of even greater economic importance to the farmer and to the country as a whole than the Mississippi-Warrior River routes have been, and would increase agricultural and other commodity exports. Various bodies have recommended the St. Lawrence Waterway as an undertaking of great national benefit. Unanimous recommendations of the project were adopted by the International Joint Commission representing United States and Canada, by the special advisory committee appointed by President Coolidge and headed by Herbert Hoover, and by a committee made up of prominent citizens of the New England states. The committee headed by Mr. Hoover estimated that there is available for movement over this waterway 23,000,000 tons of cargo and states:

"It has been estimated that the values in a single year to the farmers alone would equal the capital cost, $123,500,000, of the waterway."

As was recently pointed out by General Ashburn, the mission of the government in controlling the waterways has never been to act as a club to beat down railway

A river bank saw mill of the Pacific Northwest.

The Pacific Coast is greatly interested in inland waterways. Its two principal river systems are the Washington and Oregon projects on the Columbia River system and the California project on the Sacramento-San Joaquin Rivers system. Our picture shows one of the splendid new terminals on the Willamette River waterfront at the City of Portland.



rates . . . it has not been to furnish relief to certain sections of the country at the expense of others, but it has a well-defined mission to accomplish: the demonstration of the economic feasibility and desirability of re-establishing common carriers by water, and through co-ordination and cooperation of such carriers, to demonstrate that the whole country may reap some benefits, through cheaper transportation than would otherwise be available, of the vast sums of money that have been spent and will be spent in creating navigable streams.

Railroad Cooperation

The Interstate Commerce Commission has ruled that the carriers which make connections with the barge lines on the Mississippi and Warrior Rivers of the government-owned Inland Waterways Corporation must establish barge-rail rates and routes for the benefit of shippers, effective August 27. The general establishment of joint barge-rail rates should have a far-reaching effect upon the development of water transportation, and it is noteworthy that many railroads have hitherto been willing to cooperate. Several years ago General Ashburn made the following statement:

"We have been able, through our relations with the railroads, and through their cooperation (some of them very strong in their cooperation) to extend the benefits of cheap rates to 42 states."

At the annual meeting of the Chamber of Commerce of the United States held in 1923, C. H. Markham, then president of the Illinois Central, expressed the following views for the Illinois Central in the establishment of joint rates:

"I am not opposed to water transportation wherever it can be justified on the basis of economy and practicability. In order to assist in determining the advisability of using the lower Mississippi River, the Illinois Central has cooperated heartily with the officials of the War Department in the experiment which they have been making since 1918. If the experiment should eventually prove the wisdom of using the river for transportation, we believe the Illinois Central ought not to be barred by law from putting boats on the river and operating them in conjunction with its services by rail. That would be carrying out both the spirit and the letter of coordination."

Views of President Hoover

In his message to Congress, President Hoover stated that "some of the forces working to the detriment of agriculture can be greatly mitigated by improving our waterway transportation." In an address made some time ago which more fully defined his views upon the need for developing inland waterway facilities, Mr. Hoover said:

"Mid-West agriculture and Mid-West industry have been placed in a new relationship to different parts of our country and to the world markets as a whole. If we would restore these former relationships, we must find fundamentally cheaper transportation for our grain and bulk commodities which we export and the raw materials which we import into the Mid-West. . .

"I believe that the statement often made that, by the modernization of the Mississippi and the Great Lakes systems of waterways, we shall decrease the freight on grain to the world markets by 10 cents a bushel, is not far wrong. . . I doubt if since the days when we transformed transportation from the wagon to the railroad have we seen so positive an opportunity to assist the prosperity of our people."

The late Frank A. Munsey once published a brochure entitled "Starve the Railroads and You Starve the Nation." His statement is as sound now as it was then, but if we dwarf our system of inland waterways transportation, we limit the transportation facilities of a nation whose population within 25 years will have increased by forty millions of comfort-craving people, all entitled to the best and cheapest forms of transportation.

—Executives Service Bulletin.

Fishing A Big Business

WITH the aid of science, fishing, oldest of the vocations, has stepped into the ranks of big business. It is an industry employing nearly 190,000 persons, with a capital investment of more than $210,000,000. The annual sales amount to nearly $109,000,000.

New methods of preserving and packing fish and of using fish products have helped to make fishing an industry, and as an industry it has its own problems, like steel, lumber and textiles. Some of these are cold storage, conservation, propagation, salting, water pollution, packaging, net preservation. These are now being studied by the Natural Resources Department of the Chamber of Commerce of the United States with a view to possible aid in the improvement of conditions affecting the industry.

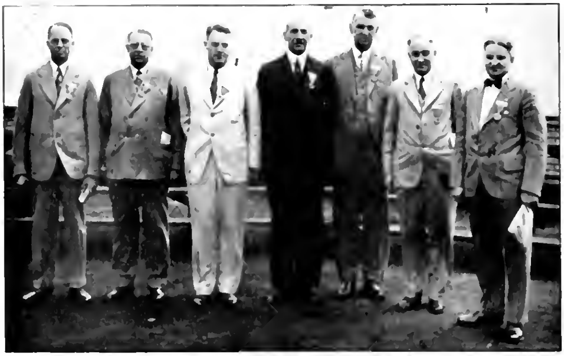
There are now nearly two score associations the members of which are engaged in fishing or in the packing and distribution of fish products.

Trade, Traffic, and Shipping

Association of Pacific and Far East Ports

Holds Sixteenth Meeting in Tacoma and Olympia

By Charles F. A. Mann



Seven prominent members who attended the recent convention at Tacoma of the Association of Pacific and Far East Ports. Left to right: C. W. Orton, president of Pierce County (Washington) Port Commission, president of the Association; George W. Osgood, manager Portacoma Piers, secretary-treasurer; J. H. Polhemus, manager The Port of Portland; Maurice Cohen, of the Wellington Harbor Board; J. B. Cox of Traffic World; A. D. Merill, port engineer, Port of Portland; B. George Hansuld, of Vancouver (B.C.) Harbor Board.

UNIQUE among the various sessions of the Association of Pacific and Far East Ports since its inception by a group of Puget Sound port managers in 1914 for the purpose of untangling the increasing complexities of port operation incident to the awakening of Pacific shipping by the opening of the Panama Canal, the sixteenth meeting held in Tacoma and Olympia on July 10, 11, 12, and 13 had the distinction of being the guests of two of the great export ports of the Northwest Pacific Coast. Tacoma, with her magnificent array of industrial piers, ranking near the top in export shipments, and Olympia, at the head of navigation on Puget Sound, with her 250,000,000 feet a year lumber cargoes, turned out in full to welcome the hundred-odd delegates to the sessions. From the moment President C. W. Orton, who is also president of the Port of Tacoma, sounded the opening call, to the late hour Saturday night, when delegates piled out of automobiles after their all-day trip to Mt. Rainier National Park, the sessions were crowded to the limit with a varied program of informative addresses and entertainment.

Through the efforts of Secretary-Treasurer George W. Osgood, who is manager of the Port of Tacoma, a carefully worked out schedule of topics were presented to the convention by ten leaders of Pacific shipping interests, beginning with a broad discussion of the cargo supply angle of the shipping business, ranging through the various phases of trade routes to the more technical part of port operations.

Shipping and Lumbering

The first address of the convention was delivered by Ernest Dolge of Tacoma, prominent lumberman and student of foreign trade. Mr. Dolge traced the closely paralleled growth of both shipping and lumbering activity on the North Pacific Coast, where the two have been very closely interwoven since the beginning of Pacific Coast commerce a century ago. Hitting the advance contracting of space aboard ships for lumber, Mr. Dolge urged the formation of an association of ship owners and operators similar to the American Railway Association. He said:

"In a sense we, as shippers, are to-day confronted by the same problem in water transportation that our predecessors encountered during the early nineties in the rail trade. Just as they had alternating periods of car surplus and car shortage, so do we meet a surplus and shortage of freight space. Such conditions bring many evils in their wake. In place of legitimate business we are forced into a considerable amount of speculation, and circumstances beyond our control make and mar our progress. To be obliged to contract space some sixty days prior to loading or at least ninety days prior to actual delivery contrasts strongly with the rail movement where a car is ordered less than two weeks before delivery to destination. . . . Shippers insist upon the right to ship what the market demands when it demands it. . . . We have other problems of less imperious nature which nevertheless complicate business and breed unnecessary conflict, among them being the barge services which facilitate dispatch but are oftentimes abused and penalized. Problems of demurrage are in an uncertain state and lead to frequent disputes."

Industries Needed

Following Mr. Dolge's stirring appeal to the operators who move lumber from Northwestern ports, W. H. Peters, manager and chief engineer of the Port of Grays Harbor, which has recently risen to the distinction of being the world's greatest lumber export port, told of the crying need for Pacific Coast ports to be

ever watchful for new industries to fit into the general economic picture of the country tributary to the individual ports. Being primarily shippers of raw materials which are sent to Eastern and foreign manufacturers, only to be sent back by ship in the form of a finished product, there needs to be close cooperation between cities and their ports to keep home dollars in circulation.

"I can go to a Portland or Seattle hardware store," says Mr. Peters, "and buy a rolling-pin made in Newark, New Jersey, from Grays Harbor spruce. I recently purchased a $3.50 card table made in the East from Western alder and fir that sold at the vessel at the west coast port for 14 cents. Women pay $1.25 a pair for silk or rayon stockings that cost 9 cents in the raw state. Cooperation between civic organizations and port authorities brought about the erection of a furniture factory employing 200 people in Grays Harbor. It cost $4500, which was very small for an industry of these proportions."

Progress of American Shipping

Unable to attend the session, Jefferson Myers, member of the United States Shipping Board, turned over his paper to Captain J. W. Brennan, port director of San Diego, to present to the convention. Dealing mainly with the progress of American shipping, Commissioner Myers drew from the vast compilation of commerce statistics some choice morsels to present to the representative men of the piers over which the rapidly mounting tonnage of United States commerce is moved.

"It is very difficult to visualize, and comparatively few Americans appreciate, the magnitude and scope of American foreign trade. Our overseas American flag services prior to the World War were few and far between. To-day American flag services operating in trade with foreign countries include 87 lines employing 671 vessels of nearly 3,900,000 gross tons. In 1928 our annual water-borne foreign commerce amounted to over 100 million long tons, valued at almost 8 billion dollars, on which the freight bill was 750 millions. Fifty-one hundred vessels of 23 million gross tons flying the flag of 28 countries participated in the carriage of American foreign trade. . . . In 1921 about a half-billion dollars worth of trade was handled between the United States and South America. In the following 7 years it had increased to over 10 billion dollars or nearly 14 per cent. of the entire foreign trade of this country. . . . Tacoma's foreign tonnage increased from 450,000 tons in 1921 to nearly a million tons in 1928. Tacoma and the Pacific ports can feel proud of their achievements toward rehabilitation of the American merchant marine and the expansion of American foreign trade."

Economics of Grain Movement

Concerning the second great cargo moved from ports of the North Pacific, B. George Hansuld, commissioner of the Board of Harbour Commissioners at Vancouver, British Columbia, now second among all the ports of the world for its grain shipment, presented a close survey of the world economics of grain movement. According to Mr. Hansuld, this comparatively new tonnage has altered the world's tramp steamer routes to a marked degree and has been one of the leading causes of the marked increase in foreign commerce with European nations.

"It may be surprising to note that the tremendous development in the grain movement via Pacific ports has directly benefited the shipment of lumber. With a bulk load of from 2 to 4 thousand tons of wheat in the lower holds, completed with lumber 'tween decks and a deck load of timber and lumber, an ideal combination for revenue is obtainable. It is gratifying to note that many British shipowners feel that the Northwest turnarounds are best for the reason that a cargo of bulk wheat and lumber is available the year round. Half of the vast exportable wheat surplus of Canada goes through Pacific ports into the markets of the world. Half of the people of the earth have never tasted wheat bread of wheat flour. One billion people border on the rim of the Pacific Ocean, and still only a quarter of the Canadian grain lands are developed. To visualize the future of the grain movement from North Pacific ports, which now ship over 200,000,000 bushels each year, and to estimate the effect on the movement of bulkier cargoes in conjunction with the wheat is hard to do, but the future holds great promise."

Mr. Hansuld's remarks come at a fitting time, when Seattle, Tacoma, Astoria, and Portland have all announced plans for extensions in the wheat storage facilities that will give the Pacific Northwest another 5,000,000-bushel storage system before the end of the present year.

Air Transport

Concluding the first general session with its array of addresses and discussions, came a deep breath from another part of the world's shipping machinery—this part only a few years old, but rapidly covering the earth with a new network of "ships" of an entirely different kind, the airplane. Fittingly, as Seattle is the home of America's greatest aircraft organization, the address prepared by Walter E. Boeing, head of the Boeing Corporation, was read in his absence by Lieutenant Eric Nelson, the famous round-the-world flyer now stationed in Seattle with Mr. Boeing. Once more the Pacific has shared the glory of a pioneer of commerce, this time the two stood side by side for a few minutes, both a part of the new order of speed and a changed world map, wherein time and the straight line are the principal factors. Mr. Boeing sketched the development of America's aircraft system, and at the conclusion Mr. Nelson gave a brief resume of his famous flight.

Pacific Commerce

During the morning of the second day, George F. Cotterill, veteran commissioner of the Port of Seattle and one of the founders of the present association, took his audience back 400 years and traced the rise of world commerce, placing the Era of the Pacific that the late Theodore Roosevelt flung to the world in still a different light. This time Mr. Cotterill painted a picture with the Pacific Ocean in the center of the two hemispheres rather than separating them. All phases of the rise and fixation of the major Pacific trade routes were laid out into a fascinating story that gripped his hearers and roused them to visualize a vast picture upon which the commerce of a new era is beginning to move with quickening pace. Crediting the Panama Canal with awakening Pacific Coast development, he continued:

"For illustration, let us note the Pacific trade routes shared by the Port of Seattle in the pre-Panama year of 1913. At that time there were 33 companies operating 133 vessels of 826,460 net tonnage, with a total commerce of about $200,000,000. Today there are twice the number of lines and three times the ships with an annual trade of about $800,000,000."

Dock Operation

Perhaps the most sizzling comments made during the sessions were uttered by A. F. Haines, vice-president of the American Mail Lines and a veteran steamship operator. Mr. Haines trotted out some weaknesses in the present system of dock operation and gave them a good airing—in the same fashion that he roundly urged the port operators to air out their warehouses that are filled with horses and automobiles in the place of orderly piles of freight and pathways between. Mr. Haines perhaps summed up in the broadest and most comprehensible manner of any of the speakers the immediate problems that must have the consideration of port operators if the already splendid facilities of the Pacific are to keep their places. A few high lights follow:

"The better your docks and equipment, the more shipping will be created and attracted to that port.

"While our facilities may be adequate for to-day's business, they are certainly not adequate for the future. The port that does not provide ample, adequate, up-to-date facilities will rapidly fall behind.

"Every port on the Pacific from Vancouver to San Diego will shortly require additional and more modern terminal facilities. More conveyors, wharf elevators, additional railway track facilities, fuel oil pipe lines for bunkering while loading or discharging cargo are needed at all ports.

"Warehouses should have concrete floors and must be provided with charging stations for electric trucks and gasoline trucks. Additional cold storage space is required to handle the rapidly growing trade to the Orient, Europe, and South America.

"Passenger traffic must not be overlooked. The day of the single deck warehouse for deep water business has passed, and all new construction should be of two floors, with passenger facilities. Our larger operating companies are planning extensive construction programs which require more modern dock equipment.

"Industrial and private terminals are one of the curses of steamship owners. Our industries seem to prefer the waterfront where land, taxes, building, and maintenance costs are high and depreciation great. If industries would use interior land of less value, with lessened costs, it seems to me that the legitimate dock operators and transportation facilities would be better off as well as the steamship lines. The expense and delay of shifting the steamers from dock to dock adds to the tariff that must be paid. The ideal steamship line would operate from one terminal in one port to one terminal in another port, which means minimum freight rates. Therefore, keep in mind that the proper terminal is one providing facilities for handling 100 per cent. of the line's business.

"Puget Sound is badly in need of a large modern dry-dock capable of caring for the largest ships. . . . Grays Harbor will in the future be a large port. . . . Tacoma needs another new, modern combination terminal. . . . No modern terminal should ever allow teams or trucks inside its doors. If the terminal was properly built it would cost less to receive and deliver the team and truck cargo at either end or the side of the warehouse."

J. R. West, port engineer of the Port of Seattle, stressed the need for adequate cold storage facilities at all ports and urged that care be taken in the construction and design of waterfront plants.

Two other technical papers were prepared and read, one by P. H. Carroll, executive secretary of the Commission of Public Docks at Portland, on comparison of leases, preferential assignment, and direct operation of port properties; the other, by E. F. Carter, vice-president of John S. Metcalf Co., Ltd., of Vancouver, British Columbia, on specialized engineering in connection with port work.

Banquet

The same evening a banquet was held at the Tacoma Hotel, with the convention's honored guest Maurice Cohen, member of the Harbor Board of Wellington, New Zealand, and former president of the Harbor Association of New Zealand, only South Pacific delegate to attend the convention. Mr. Cohen gave a dramatic picture of the great Wellington harbor and paralleled its unique organization and operation as well as the sharply contrasting financial aspects of the typical Pacific Coast public terminal. The Harbor Board has absolute control of pilots, land, buildings, navigation, licensing, lighting, leasing, pipe lines, and finances of the entire harbor, with assets of $12,000,000 and liabilities of about $6,000,000, and a cash surplus of over $5,000,000. Members of some of the newer and smaller coast ports smiled sadly after hearing these figures and contrasting them with their own water-logged fiscal standing.

After the morning session the entire delegation boarded a boat for Olympia and were welcomed there by Governor Roland H. Hartley and were the guests of the Port of Olympia. Golf and dinner dance at the Country Club rounded out the day at the Capital port, after an inspection of its port properties which have made such a remarkable record during their three years of existence.

Saturday the entire day was spent at Mt. Rainier National Park, where the nautical-and-land men frolicked in the snow and ice of the most famous glacier region in America, only two hours from tidewater and the boats.

At the close of the sessions Friday, special honor was paid to Maurice Cohen of the Wellington Harbor Board and S. A. Wales, engineer for the Port Trust of Bombay, India, the only Asiatic port representative to attend. San Diego was selected to be the meeting place for 1930; and the following officers chosen for the 1929-1930 term:

M. A. Graham, president of the Board of Harbor Commissioners, San Diego, president;

C. W. Orton, president of the Port of Tacoma, first vice-president;

Ralph T. Fisher, president of Port of Oakland, second vice-president;

J. W. Brennan, port director, Port of San Diego, secretary-treasurer.

Directors: B. George Hansuld, Vancouver harbor commissioner; P. H. Carroll, executive secretary, Commission of Public Docks, Portland; Major C. L. Tilden, president, Board of State Harbor Commissioners, San Francisco; Bert Edwards, general manager, Los Angeles Harbor Board; George F. Cotterill, port commissioner, Seattle; W. H. Peters, manager and chief engineer, Port of Grays Harbor.

The convention resolved to go on record as opposed to free trade with the Philippines, and honored two members who died during the past year, Captain W. P. Cronan of the San Diego Board of Harbor Commissioners and Captain Jacob Harban of the Department of Docks, Portland.

American Foreign Trade in 1929

National Foreign Trade Council Issues Annual Hand Book

AMERICAN exports will be close to $5,400,000,000 for the fiscal year 1928-1929, the highest record since 1920, according to the estimate of the National Foreign Trade Council. This means that at the dollar value of 1913 we are shipping more than 40 per cent. more goods abroad than before the war. The export balance will be close to a billion dollars, or about one-third larger than for the average of the past five years.

"American Foreign Trade in 1929," the record of the Sixteenth National Foreign Trade Convention at Baltimore this spring, explains many of the reasons for this continued spurt in American foreign trade growth. Chief among them is the American habit of scientific merchandising which has retained practically all the customers secured when Americans first began vigorously campaigning for foreign trade after the war and has annually added many more. The current issue of the foreign trade hand book instances many cases of this policy. It makes a special feature of installment sales abroad which was discussed with considerable thoroughness by E. G. Simons, vice-president of the American Foreign Credit Corporation, New York. It also contains discussions widely participated in by the delegates at the convention of the advantages of credit insurance, modern methods in export advertising, and a comprehensive discussion of the service technique that accompanies American salesmanship.

The council includes in its final declaration, printed in a prominent place in the volume, the following statement:

"International balancing of trade should not be prejudiced nor the continued expansion of our merchant marine, consequent upon the increased exports and imports, both of which are essential to the maintenance of prosperity and employment, by any procedure which might invite serious retaliatory action. We must not retard the natural inward flow of goods by which our foreign customers can pay in their own products for obligations incurred and for purchase of goods. We should continue the policy of fair and considerate encouragement of the consumption here of foreign products required in the normal expansion of our own industries and for the benefit of our people."

The Baltimore convention was the largest the Council has held since 1920 and the largest it has ever held on the Atlantic seaboard. Latin America was the leading theme of the discussion, the principal addresses being delivered by L. A. Downs, president, Illinois Central System, Chicago, on "Our Commerce With the Other Americas," and by His Excellency Senor Don Carlos G. Davila, Ambassador from Chile to the United States, on "Political, Economic, and Cultural Pan-Americanism." The closing address by James A. Farrell, chairman of the National Foreign Trade Council, on "The Business of the Sea," (see page 226, Pacific Marine Review, June, 1929) was a careful and realistic analysis of the part played by the American merchant marine in our foreign trade. Secretary Lamont's speech on "Prospects of United States Foreign Trade" (Page 227, Pacific Marine Review, June, 1929), and addresses by Henry F. Grady, dean of the College of Commerce of the University of California, Berkeley, on "The Part of Imports in Foreign Trade"; by M. J. Falkenburg, president of the Falkenburg Trading Company, Seattle, on "Progress in the Far East"; by Lynn W. Meekins, United States Commercial Attache, Ottawa, on "Canada—Our Best Customer," and by M. Marcel Knecht, general secretary of Le Matin, Paris, on "Economic Developments in the Colonies of France," are among the other important addresses in the volume.

A full account is given of the Communications Demonstration, at which the principal American communications companies girdled the world five times in showing the accuracy and speed of messages carried by American systems.

The number of delegates attending the convention was 1615, including 65 delegates from abroad, and American foreign traders from 34 states and 125 cities.

The book is available at $2.50 a copy and contains a carefully prepared cross index of all topics and markets discussed from the platform and from the floor, an alphabetical list of delegates, and the Final Declaration of policy and principles adopted at the meeting.

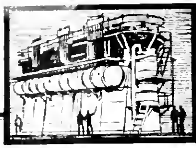
Address order for this book to National Foreign Trade Council, India House, New York.

A New Phase in Chinese Trade

ONE of the interesting features of the new day in China is the entry of native Chinese firms into foreign trade. As indicated by United States Consul Samuel Sokobin of Foo Chow, "less than ten years ago the manager of a leading American banking institution in China estimated that not more than 2 per cent. of the letters of credit opened for imports with this bank were placed by Chinese firms."

In contrast with that condition, it is interesting to note that approximately 10 per cent. of the total raw silk exports from Shanghai during the first six months of 1929 was handled direct by five Chinese concerns, of which two are silk spinners and weavers, one owns a silk filature, one is indirectly involved in silk filature ownership, while the other is simply an exporting firm. The majority of these firms have members of their staffs in Europe and America studying market conditions.

Another indication of this trend is found in the announcement by a leading American automobile manufacturer that he had established a definite policy of placing agencies in China only with native firms. This trend foreshadows the disappearance of small foreign firms from the small Chinese ports and the consolidation of large foreign firms in the larger Chinese cities.



In the Engine Room

Maintenance and Operation of Marine Condensers

I. A Short Sketch of Condenser History

PROBABLY no part of the steam power plant afloat and ashore has caused more grief to the designer and operator than the condenser, whose function is to cool the steam leaving the engine and to preserve thereby a vacuum or negative pressure and so allow the steam to produce more power.

In starting a series of articles dealing with the marine condenser, we are intending simply to bring before our readers a resume of the principal work so far accomplished in solving condenser problems and to interject, from time to time, articles by experts covering certain phases of this subject. In order to create a background for the series, we will, in this first article, give a short account of the early work of marine steam engineers on the condenser problem.

The first steam engines were, in themselves, condensers. Steam was used by the engineers because it was so readily changed from the gaseous to the liquid state and, in being so changed, produced "that vacuum which nature was supposed to abhor and to fill which she would perform the work of horses." A cylinder containing a piston and open at the top was filled below the piston with steam at atmospheric pressure. A jet of cooling water was admitted into the steam below the piston and the steam became liquid, producing a vacuum, whereupon the positive atmospheric pressure above the piston would perform useful work by forcing the piston down. This form of steam engine was used up to the time that Watt decided to improve it by making a double-acting engine and condensing the steam in a separate chamber. The use of the water spray for condensing steam continued long after Watt's day, and gave its name to the common or jet condenser which was almost universally used in marine practice down to well after the middle of last century.

Jet Condenser

The jet condenser consisted of an air-tight chamber, the shape of which was immaterial so long as the inlet for the steam was high enough to prevent water from running back into the engine cylinder, and so long as its bottom was shaped so that the water would all drain into a suction sump for the air pump. Into this air-tight chamber a pipe connecting with sea water was led in such location as to intercept the flow of exhaust steam into the chamber. This pipe was arranged so as to spray the water through the steam, with the result that the steam condensed and fell to the bottom along with the water from the water spray. The bottom of the jet condenser was connected with an air pump, which pumped the air and the water out of the chamber in order to preserve the vacuum.

In the old days of marine engineering, these jet condensers were generally formed to suit the ship and the working parts of the engine. Frequently they were a part of the engine framing or were built into the back columns of vertical engines or the frames of horizontal engines. The practice, however, sometimes proved dangerous where rapid corrosion of the frames from tropical sea water caused weakening of those members. In naval engineering this practice was expressly forbidden.

As in the case of the original steam engines before the time of Watt, it was found frequently on some steam plants that the jet condenser was the principal power producer for propulsion purposes. Hence we have many stories from old chief engineers whose memories run back to the huge, single-cylinder, large diameter, long stroke engines of the 50's and 60's, in which these gentlemen tell us of running into port at 10 to 12 knots speed with no steam pressure at all showing on the gauges but with a good 25 inches of vacuum showing on their jet condensers.

In the design of jet condensers, the capacity of the chamber was generally about one-third that of the engine cylinders exhausting into it, and arrangement was made for the injection of water equal to about thirty times the weight of the steam for temperate zones and thirty-five times the weight of the steam for the tropics. It will be noted, in this connection, that the contents of the hot well would consist of a mixture of condensing water and condensed steam which would be nearly as salty as ordinary sea water. Many experiments show that the loss from blowing off boilers to prevent dangerous incrustation from the salt water feed provided by jet condensation amounted to as much as 25 per cent, and was very seldom less than 12 per cent. There was also great loss in ship's time and speed from the necessity of frequent shutdown for scaling and cleaning of boilers. This, of course, became increasingly evident as steam temperatures and pressures were raised in the evolution of the modern economical steam plant; and when pressures got up to 30 to 40 pounds above atmosphere it became apparent that jet condensation was not suitable and marine engineers were forced to go to surface condensation, which soon proved to be far more economical and practical.

Surface Condensers

The idea of surface condensation in which steam to be condensed is brought into contact with surfaces

cooled by circulating water and separating the steam from the water was the subject of patents as far back as 1794, when an English inventor by the name of Cartwright took out a patent for an engine in which the steam was condensed between the surfaces of two metal cylinders which were cooled by water circulating within the inner cylinder and outside of the outer cylinder. An engine built on this principle was said to have given good satisfaction. Several patents for surface condensers having small tubes to provide cooling surface were taken out in the early years of the Nineteenth Century. The most practical and successful of these was designed by Samuel Hall, and to that inventor is ascribed the beginning of the development of the modern surface condenser. One of the first ships fitted with this apparatus was the Sirius, the steamer which in 1838 is said to have made the first transatlantic voyage from England to America completely under steam. Some troubles developed with Hall's invention and prejudice drove it off the market for many years.

In all of the first surface condensers, including Hall's, steam passed through the tubes and the circulating water outside of the tubes. In all of these early condensers, also, copper was used for tubes. In those days, animal oils were used for lubricants, and it was soon discovered that the acids derived from the fatty materials in these oils would work over in the steam from the cylinders and dissolve some of the copper in the tubes, producing soluable salts of copper which, when pumped into the boiler with the feed water, would cause rapid corrosion in the boiler plates. This was one of the main reasons for the early prejudice against the surface condenser, but the great saving in fuel effected by its use kept marine engineers experimenting, and this difficulty was eliminated by tinning the copper tubes and discontinuing the use of tallow. It was not, however, until after 1860 that the surface condenser came into general use; and it was only after mineral oils were used exclusively for internal lubrication that these objections to surface condensation completely ended. In 1860, or thereabouts, brass tubes of various compositions began to be substituted for copper, and today practically all surface condenser tubing afloat and ashore is made of copper and zinc alloys.

Two New Pulverized Coal Steamers

By H. M. Wick

TWO specially designed colliers particularly constructed for the burning of pulverized coal as fuel were recently built at the Quincy Plant of the Bethlehem Shipbuilding Corporation and will be used by the Berwind White Coal Mining Company in their Virginia-New England trade. It is hoped that their operation will demonstrate the fuel economy to be derived by the use of powdered coal as versus fuel oil. These colliers have been named Berwindglen and Berwindvale.

The Shipping Board and one or two private ship owners have been somewhat active in the conversion of existing tonnage to burn pulverized coal, but these will be the first vessels to be constructed in this country having their steam plants especially designed for the use of powdered coal fuel. Of course, in building new tonnage a better opportunity is available to lay out the coal bunkers so that gravity flow of the fuel to the pulverizers is assured and also for the proper location of coal crushing and pulverizing apparatus, distributors, fans, and other auxiliaries.

These new colliers cost $750,000 each. They will maintain a service speed of 10½ knots, and the maximum coal carrying capacity will be about 6935 tons. They will have a deadweight carrying capacity on 25 ft 3 ins. draught of about 7240 tons and, operating at the designed load draught of 23 feet 6 inches, their deadweight capacity will be about 6510 long tons with a displacement of about 9290 tons. Provisions for the stowage of 300 tons of bunker coal will be made in gravity flow bunkers. The general dimensions are: Overall length 366 feet 6 inches; length between perpendiculars, 350 feet; beam, 50 feet; and depth molded to upper deck at side, 30 feet 3 inches. They are of the single deck type with forecastle head, bridge amidships, and poop; single screw with machinery located aft; and having complete double bottom for ballast water and boiler feed, deep tank for water ballast, and no top side ballast tanks. There are four coal cargo holds served by eight extra large hatches.

Of course, to the marine engineering field the most interesting feature about these new ships is the pulverized coal burning outfit and the propelling machinery. With two types of marine boilers in general use, the Berwind White Company and its naval architect, Theodore E. Ferris, have adopted high steam pressure and high temperature water-tube boilers for one vessel in combination with double reduction geared cross compound type turbines; while in the second ship Scotch boilers operating at 180 pounds pressure will supply steam to a triple expansion engine. Thus a direct comparison can be secured of the efficiency in burning powdered coal in these two types of boilers in combination with two common types of propelling machinery.

Babcock & Wilcox pulverized coal equipment is to be used, consisting of a Fuller-Lehigh ball type mill driven by a turbine equipped with their feeder and Babcock & Wilcox powdered coal burners on the boilers, the whole arranged as a unit system and one set of apparatus for each boiler. The mill is to be operated under pressure so as to keep the coal out of the blower. For lighting-off purposes, a small oil system will be used consisting of a small steam pump, piping, burners, and an oil storage tank of about six tons capacity. No heater will be required for this system as light fuel oil is to be used. A coal crusher will be installed on each of these colliers, although the owner expects to bunker these ships with slack coal that has already passed through a 1¼-inch mesh and which can be fed direct to the pulverizing machines. However, the crusher will be provided as a secondary consideration for use in case of necessity only when slack coal might not be available. This crusher will have a capacity of about 50 tons of run-of-mine coal per hour, and will be installed in the center of the coaling hatch with a hopper above it.

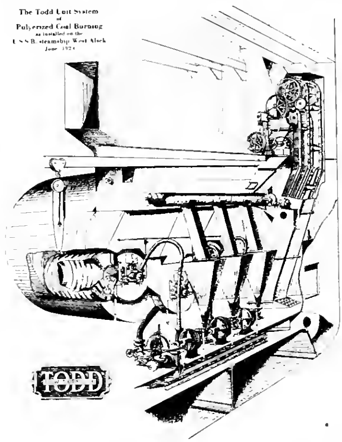
Pulverized Coal Steamer West Alsek

The Todd Unit System of Pulverized Coal Burning Proves Very Successful on Converted Shipping Board Freighter

A FORWARD stride in the development of pulverized coal burning equipment for marine use was made on June 19 with the successful sea trial of the United States Shipping Board freighter West Alsek equipped with the Todd Unit System of burning pulverized coal by the Todd Shipyards Corporation.

The trial was of 12 hours duration. The vessel was subjected to every possible maneuver, including a run over a 32-mile course off Fire Island at an average speed of 12.7 knots.

As a result of the vessel's fine performance, officials of the United States Shipping Board accepted her at the conclusion of the run and immediately ordered her to proceed to Baltimore to load cargo for Avonmouth, England. She sailed for that port from New York about July 3.



Diagrammatic section through the boiler room of the West Alsek showing arrangement of conveyors, pulverizers, blowers, and burners of the Todd Unit System of pulverized coal burning.

About 200 men prominent in the marine industry were on board during the trials. Among them were representatives from China, Japan, South America, Italy, Germany, the Scandinavian countries, Canada, and England. All expressed themselves as being very favorably impressed with the vessel's showing.

Like other vessels of the same type, the West Alsek has been regarded as rather expensive to operate, being a hard steamer and requiring considerable labor to handle coal from the bunkers to the furnaces, as the coal is stored partly in the 'tween decks and partly in the cross bunker. With the new installation it is expected that the operating costs will be greatly reduced. Comparative figures will be given out later. Another feature of the new installation is the improvement in working conditions of the fireroom crew, due to the fact that no coal dust or ash is visible at any time. Combustion is practically as complete as though oil were being used instead of coal.

The coal pulverizing machinery and burners on the West Alsek were developed by the engineers of the Todd Shipyards Corporation in cooperation with the Erie City Iron Works and the fuel experts of the fuel conservation committee of the Shipping Board, working under the direction of Carl J. Jefferson. The installation was made at the Tebo plant of the Todd Shipyards Corporation.

Compactness of the mills, the high degree of fineness of pulverization, and the fact that the equipment has been installed on a typical cargo ship without encroachment on the spaces beyond the fireroom

Boiler room of the West Alsek showing, at the left, pulverizers driven by Westinghouse steam turbines and, at the right, the furnace fronts with Todd pulverized coal burners.

are features which attracted the attention of the experts inspecting the workings of the system.

The burners are believed to be the most effective type for securing a good mixture of coal dust and air for combustion. They are so arranged that adjustments can be made on the diffusing cone from the furnace front. Provision is made for the introduction of an ignition torch and a small capacity oil burner is installed for this purpose. Allowance also has been made for the introduction of a large capacity oil burner when fuel market conditions may make its use desirable.

Coal is trimmed from the bunkers through a crusher of the high speed, fixed hammer type, with a hinged bottom to facilitate the removal of tramp iron and other solids. After passing through the crusher, which reduces it to half-inch size, the coal goes to a screw conveyor which delivers it to the individual pulverizers connecting with each of the nine furnaces. The pulverizers are driven by direct-connected Westinghouse steam turbines.

Under reduced loads, such as maneuvering or in port, provision is made to shut off the supply entirely from one or more of the mills. The mill is of the two-stage, centrifugal type, fitted with a fan having tangential discharge. The coal is discharged from the fan to the burners through flexible tubing.

In passing through the burners, the coal and the primary air which is conveying it are given a rotating motion by the internal diffuser. This rotation is augmented by tangential air flow produced by the secondary air coming through the registers fitted in the Howden fronts.

When the West Alsek sailed for Avonmouth she had on board as observers Carl J. Jefferson, head of the Fuel Conservation Committee of the United States Shipping Board, and Perry Haynes, one of the Todd company's engineers, who has played a big part in the development and perfection of the equipment.

Care of Donkey Boilers

Should They Be Laid Up Wet or Dry?

ANY piece of marine equipment which is used intermittently is in need of more than intermittent attention if it is to function properly when suddenly called on in an emergency. The donkey boiler is an excellent example. There is probably no single piece of equipment on shipboard that is generally subject to so much neglect and abuse and none that is more important in certain emergencies.

The term itself is interesting. It is not in the dictionary. Donkey engine is carefully listed and defined, but no donkey boiler. "Donkey Engine, a steam engine which furnishes power to hoist anchor and sails, turn cargo winches, supply heat, and operate fire pumps and radio." [Bradford's Glossary of Sea Terms]

This would be some versatility for a steam engine and it is evident that the glossary is here defining the function of the donkey boiler. All of which leads us to the reflection that the engine for cargo winch, for pump, or what not, on the sailing ship was known as a donkey. Hence the boiler was the donkey's boiler, the operator the donkey's man, and so on. Many old sailing ship log books bear eloquent testimony to the neglect of donkey boilers and to the subsequent results. (Query) Was it called donkey because so often balky?

The practical steamship operator knows that the poorly kept donkey boiler not only may be a source of danger through failure to function in emergency, but also is sure to be an enormous fuel consumer when it does function. Such an operator recently issued instructions to his engineer personnel afloat on the "Laying-up of donkey boilers," from which we cull the following directions.

All valves should be absolutely tight, as the slightest dampness will cause rust.

The external asbestos covering should be removed and the entire boiler outside and in thoroughly scaled, wire-brushed, and swept. Any cement on floor plates should be broken out.

All metal on the water side as far as accessible should be painted with white zinc. On the fire side the uptakes, back ends, and furnaces should be painted with red oxide of lead.

All tubes and tube sheets should be swabbed with linseed oil.

Any parts of the floor that do not drain should be drilled and tapped.

Exterior of shell should be painted with red lead and finished with a coat of buff.

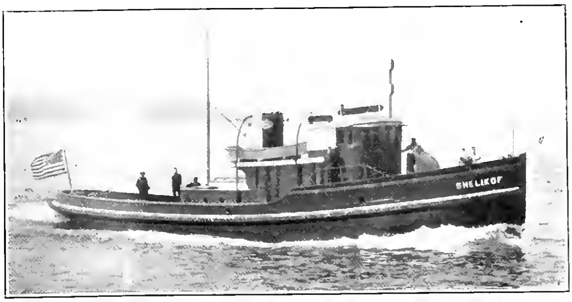
Pans of lime should be placed on bottoms of boilers and on tops of tubes to absorb moisture.

Gasket on manhole cover should be renewed and boiler closed tight.

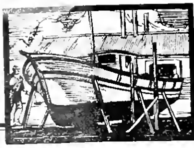
On talking this over with a young scientific steam engineer, he ventured the suggestion that it would be better to fill the entire boiler with water, put a few handfuls of soda ash in the water, and seal up tight. This on the ground that there is more free oxygen in the air to cause corrosion than there would be in the water.

It is a fact that the inspection of boilers after periods of several months dry lay-up often reveals an inert atmosphere of nitrogen, all the oxygen having been used up in corrosion action.

We would like to hear from operating marine engineers as to their experience in this matter.



A typical Puget Sound cannery tender and towboat.



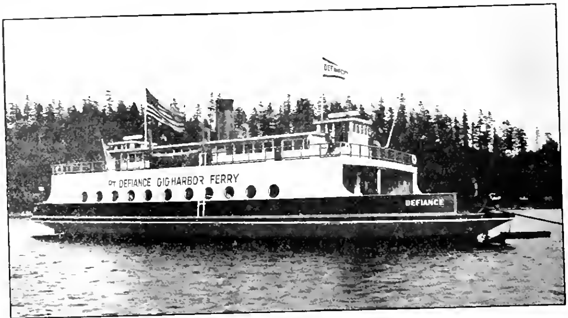
Workboats and Their Power Plants

With the Northwest Boat Builders

WORK was started July 8 on a new 76-car ferry to replace the steam ferry Gig Harbor, which recently burned to the water's edge at her moorings in Gig Harbor, Washington, at a loss of about $75,000. The new ferry will cost about $45,000 and her power plant about $50,000 making the total cost for the completed ship at around $100,000, and will give her operators, the **Washington Navigation Company** of Tacoma, the distinction of being the operators of the largest fleet of diesel ferries in the Northwest. The Gig Harbor-Point Defiance route will now have three large ferries for continuous daily service on one of the heaviest traveled ferry runs on the Pacific Coast. Approximately 200,000 cars a year use this route, thus placing heavy demands during rush hours on this 5-mile route across the Tacoma Narrows to the Kitsap-Pierce County peninsula and Olympic Peninsula.

The new ship will be built of wood, the heaviest of fir construction, and be powered with twin 210-horsepower **Fairbanks - Morse** diesels operating opposed propellers. Work is being rushed at the plant of the **Skansie Shipyards** in Gig Harbor, builders of the entire fleet of the Washington Navigation Company. The new boat will carry 6 more cars than her twin sister ferry, Defiance, and will be 165 feet long, 52 feet wide, and molded depth of 14 feet 6 inches.

It is interesting to note in connection with the new ship that the entire fleet is powered with Fairbanks-Morse diesels, all of which have abnormally heavy duties to perform and have rendered excellent service during their period of operation. The other ships in the fleet, which covers four important routes, are the City of Tacoma, the City of Steilacoom, the Defiance, and the Wollochet. The Wollochet and City of Steilacoom each carry 30 automobiles, while the Tacoma and the Defiance each carry about 70 cars. The new ship will be the flagship of the fleet and will have a capacity in excess of any other ferry operating on Puget Sound. She will be in operation in September.



Fairbanks-Morse diesel-driven double-screw automobile ferry Defiance.

The **Western Boat Building Company** of Tacoma is rushing to completion two purse seiners for the fishing trade. One, the Rally, built for John Grando and Marion Spangol of Hoquiam, is 68 feet by 15 feet 3 inches, is powered with a 120-horsepower **Washington Estep** diesel. The other is the Frances, a 65-footer, built for M. A. Rabassa and Peter Carovich of Tacoma, powered with an **Atlas** diesel.

The **Willamette Iron and Steel Works** of Portland, Oregon, is completing the installation of a 400-horsepower **Atlas** diesel in a large tug operated by the Smith Towing Company.

An interesting little ship recently completed is the Mary W., a speedy patrol and supply cruiser for the Bellingham Canning Company. She is 48 by 12 by 4 feet in over-all dimensions and is powered by a 175-horsepower **Hall - Scott** engine driving through a reduction gear at a 2-1 ratio, giving her a speed of about 15 knots. This cruiser was delivered to her owners by the **Bellingham Marine Railways.** At the present time this company is remodeling a cannery tender of 34 feet by 8 feet 6 inches by 4 feet dimensions for Joseph McMillan, installing a 125-horsepower **Sterns** gas engine.

Last week the **Bellingham Marine Railways** completed work on a trim little double-end ferry to the order of the Whatcom County Commissioners for service on a new route between Bellingham and Lummi Island. This ship has a capacity of 10 automobiles and is 65 feet long with 25 feet beam and 6 feet 6 inches depth. She is powered with a 75-horsepower, 3-cylinder **Atlas** diesel. She was designed by **L. H. Coolidge** of Seattle and carries a crew of two—engineer and pilot, which gives her an extremely low operating cost. A purse seiner of 65 by 16 by 7 feet 6 inches dimensions, powered with a 50-horsepower **Standard** gas engine is being built at the plant for John Evich of Bellingham.

Over on the other side of Bellingham harbor, the plant of **George Wrang** has been busy turning out

some fine little ships for use in the northern waters. Work has been finished on the government patrol ship Coot, operated by the Bureau of Fisheries along the Youkon River. She is 50 feet long by 11 feet 3 inches beam and 3 feet draft and is powered with a 100-horsepower **Hall-Scott** engine.

A 43 by 12 by 3 feet 6 inches purse seiner powered with a 24-horsepower **Cliff** gas engine has also been finished.

A beach seiner 20 feet long by 6 feet beam, powered with a 4-horsepower **Cliff** engine, and another 18 by 5 gill netter, both unusual and rare types of small powered commercial craft, are also being built.

The purse seiner Hercules, built for Sam Percine and Nicholas Petronovitch of Bellingham, powered with a 100-horsepower **Atlas** diesel, has also been finished. This ship is of the heavy, large type, having dimensions of 70 by 16 feet 6 inches by 5 feet and suitable for open waters.

Ask any old timer on Puget Sound about barges, and the first thought will be that of **H. B. Kirby** of Bellingham, pioneer Puget Sound barge builder who during 47 years has turned out the finest collection of heavy wooden barges built in this country. During the past half century Mr. Kirby has personally built over 600 barges, having a value of from 4 to 14 thousand dollars each and an average tonnage of about 100. Many of these barges have been built for the Pacific American Fisheries in Bellingham, and just now work is being speeded on a $14,000-barge order for that company. During his career Mr. Kirby has also built 30 tugs, including the Councilman, a famous island tug now stationed in Hawaii.

Wrang Shipyards at Bellingham, Washington, recently completed the purse seiner Hercules for Nicholas Petronovich for use in Southeastern Alaska. She is 70 feet long, 17 feet beam, and powered with a 100-horsepower **Atlas-Imperial diesel.** She has a speed of about 10 knots and a tonnage of 45, with accommodations for a crew of nine. The United States-Alaska Packing Company is the owner.

Ivar Chilman **Yards,** Hoquiam, Grays Harbor, Washington, are completing for the Schafer Bros. Lumber & Door Company of Hoquiam the first steel tug ever built on Grays Harbor. The ship is 67 feet long, 17 feet beam, and powered with a 250-horsepower diesel.

Everett Marine Ways recently completed the cannery tender Snowball for Alaskan duty for the Everett Packing Company. She is 42 by 14 feet, draws 18 inches of water, and is powered with a 50-horsepower **Redwing** gasoline engine. She carries fuel for a 1000-mile journey and is flat bottomed for use in fish trap areas in the North.

Kanaga Ranching Company of Seattle recently ordered the old City of Portland fireboat Chief brought to Seattle to be stripped of part of her equipment and sent to the yards of the **Lake Union Dry Dock and Machine Works,** where she will be rebuilt and equipped with a pair of 200-horsepower **Washington-Estep** diesels. She is 125 by 25 by 12 feet, and will be used by the company as a tender for its fox farms in the Aleutian Islands.

Washington Iron Works, Seattle, Washington, manufacturer of **Washington-Estep** diesel engines, is building engines for some work and pleasure boats which will shortly be added to the fleets at Pacific Coast ports.

An interesting conversion in tuna boats in California coast waters is the Vaughn, recently sold to Harry Fisher, of Los Angeles. The Vaughn was formerly a sub-chaser, and when new engines are installed, the boat will join the California tuna fleet out of San Pedro.

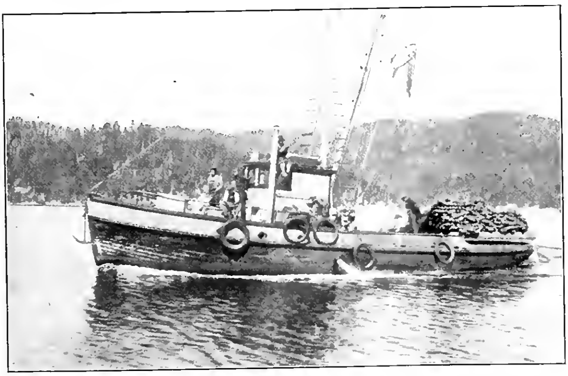
A 200-horsepower 6-cylinder direct-reversing, **Washington - Estep** diesel engine has recently been purchased by Mr. Fisher for installation on the Vaughn.

A 425-horsepower, 6-cylinder, direct-reversing, **Washington - Estep** diesel engine is being installed by the Washington Iron Works in a former navy tug boat hull purchased by Mr. Ultican, of the Ultican Tow Boat Company, Aberdeen, Wash. This boat will be used in general towing service at Grays Harbor, Washington.

The fourth **Washington-Estep** diesel engine to be purchased by Dick Suryan, of Anacortes, Washington, has been ordered by him for installation in a 72-foot boat built by the Martinac Shipbuilding Company, Tacoma.

When completed this boat will be chartered by one of the Alaska herring fishing companies.

Kruse & Banks Shipbuilding Co., Inc., North Bend, Oregon, has under construction a sturdy little tug boat for the Coos Bay Dredge Co. This boat will be named Coos Bay, and will have a length of 50 feet, beam of 14 feet, and draft of 6 feet. She will be strongly built of P.O. cedar frames to stand hard use. Her power plant will consist of a 125-horsepower **Atlas-Imperial** diesel engine, and the vessel should give a good account of herself in service.



The Tanana, a typical Puget Sound seiner, owned by the Nootka Packing Company of Vancouver, British Columbia; 52 feet long, 14 feet beam, powered with Petrel reduction-gear model Sterling gas engines.

British Harbor Tugs

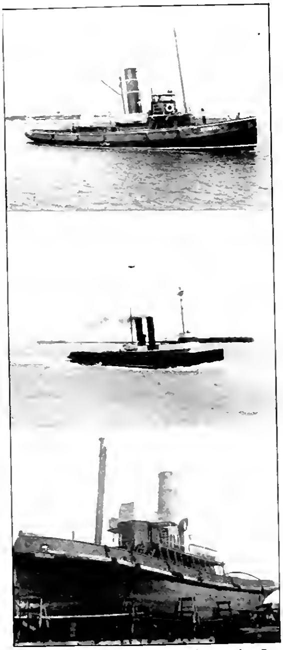
By R. C. W. Courtney

As may readily be imagined, the large harbor tug designed essentially for assisting seagoing vessels in confined waters has reached a high pitch of development in Great Britain, where many fine examples of this type of craft are to be found at the principal ports and naval dockyards. It is interesting to compare the general features of these large British tugs with vessels used for similar purposes in America, as the design and arrangement of deck houses and fittings differ to a considerable extent from standard American practice.

British tugs invariably tow from a slip hook situated at the back of the boiler casing or over the engine skylight, special stiffening being provided to withstand the towing strains. The superstructure is kept as low as possible, with elaborate guards for the tow rope arranged over the after part and, although an enclosed pilot house is not generally provided, some of the larger craft have quite imposing bridges.

Steam propelling machinery is still preferred, and both twin and single screw installations of considerable power are to be found. The most powerful tugs at present in service in British waters were built for the Admiralty for towing battleships and develop upwards of 2500 indicated horsepower with twin sets of triples and four single-ended Scotch boilers burning coal, the length between perpendiculars being 175 feet and breadth 34 feet. The naval authorities also employ a number of smaller tugs developing from 1200 to 2000 indicated horsepower and which are of both the twin screw and paddle types, the latter being extremely interesting craft with two sets of engines arranged so that they can be operated one ahead and one astern for maneuvering purposes.

The most powerful tugs under private ownership are to be found at Southampton where, apart from one of the large 2500 indicated horsepower government vessels which has been converted to a combined tug and passenger tender, a number of fine craft developing from 1300 to 1600 indicated horsepower are employed in handling the great Atlantic liners, such as the Leviathan and Majestic, and particulars of a typical example are



Three typical British tugs. Above, the Sun VI, single screw, 900 I.H.P., for Thames service; center, the Lady Brassey, working at Dover; lower, the Hector of South Hampton hauled out on a slip way.

perhaps of interest. The Hector, one of several similar tugs, is 130 feet in length betwen perpendiculars with a molded breadth of 25 feet and molded depth of 12 feet 6 inches, the draft under service conditions being 6 feet forward and 12 feet aft. The loaded displacement is 470 tons with an immersed midship sectional area of 179 square feet. Construction is to Lloyd's requirements. The propelling machinery consists of two sets of compound engines 19 inches and 38 inches by 30-inch stroke, taking steam from two boilers 13 feet 6 inches diameter by 10 feet 6 inches at 104 pounds working pressure and turning 10 feet diameter by 13 feet pitch propellers at 105 revolutions per minute.

A similar vessel, the Lady Brassey, is owned at Dover and has carried out some magnificent salvage and rescue work from the Goodwin sands at various times.

At London and Liverpool single screw tugs of about 1000 indicated horsepower are used, the dimensions averaging 100 by 25 by 13 feet; and slightly smaller craft are to be found at Hull, Glasgow, and Newcastle-on-Tyne.

SAN FRANCISCO BOAT YARD BUSY

Anderson & Cristofani, Hunter's Point, San Francisco, has had a busy season with orders for pleasure and workboats for various owners. One interesting job recently completed is a 60-foot cruiser for Herman Hogrefe, which proved herself to the entire satisfaction of her owner, showing a speed of 13½ miles an hour on her trials. The cruiser was designed by Lee and Brinton of San Francisco.

This yard now has under construction two fish boats for S. Larco Fish Co. of Santa Barbara, 45 feet long, 13½ feet beam, 5 feet draft, to be powered with 50-horsepower **Atlas-Imperial** diesel engines.

Another recent order is for a fish boat for W. Ventimiglia of Monterey, to be powered with a 55-horsepower Atlas gas engine.

Along a little different line is a little 23-foot knockabout sailing sloop adapted for San Francisco Bay use, for which this yard has received order.

In addition to the new construction the yard is kept busy with the usual run of repairs to work and pleasure boats.

TRADE NOTE

Diamond Power Specialty Company, of Detroit, manufacturers of Diamond Soot Blowers, announced the following agency appointments in the marine field effective June 1.

Gulf Engineering Service and Specialty Company, Inc., New Orleans, for the territory of New Orleans and adjacent Gulf Coast and Mississippi River points.

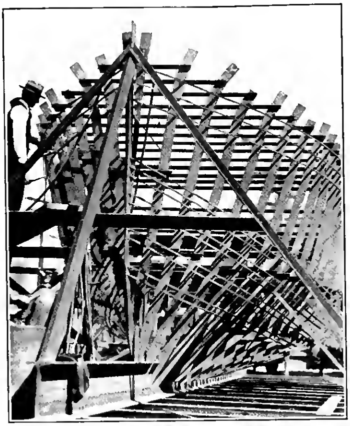
Marine Specialty Company, Mobile, Alabama, for the territory of the ports of Pensacola, Mobile, and Gulfport, and intermediate ports.

Knowles Iron Works, Galveston, Texas, for the territory of the Ports of Galveston, Houston, Lake Charles and intermediate ports.

An All-Welded Steel Yacht

AT the yard of the Standard Steel Shipbuilding Corporation, located at Los Angeles harbor, there is now under construction a very interesting all-steel yacht comprising several novel features. The illustrations show very clearly the method of construction, which is entirely by welding.

A heavy I-beam is laid down for the keel. This beam is longer than required, extending forward and aft. To this beam bars shaped as stem and as transverse frames are welded, the frames being notched on the turns of the bilges to take light, longitudinal members. The extension of keel in way of the transome stern is formed by a heavy channel welded to the I-beam. All shell plating will be butt-welded at joints and welded to all frames. When the hull is finished the exposed portions of the keel beam will be cut off flush with an acetylene torch.



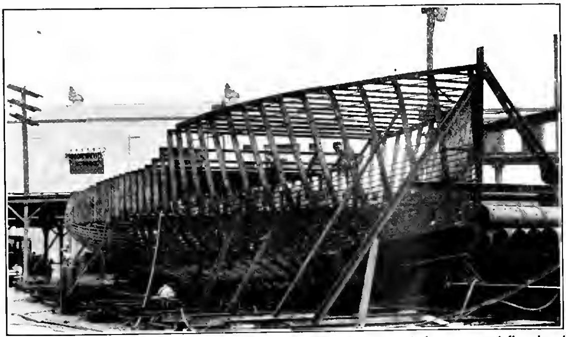
Bow view of all-welded steel yacht under construction showing framing and stem welded into I-beam keel.

The hull of this yacht is 56 feet in length over-all and 13 feet 6 inches beam. She will have three water-tight steel bulkheads dividing the under-deck space into four water-tight compartments. Double bottoms are arranged as oil storage, with 15 tons capacity, or sufficient for 5000 miles cruising radius. There are four tanks in the double bottom, with pump arrangement for transfer between tanks to trim ship if necessary. This construction aids stability and greatly increases the strength and stiffness of the hull. Considered as a girder, the consolidated hull, supported at its center and fully loaded, will show a deflection not exceeding one four-thousandths of its length.

The main power unit will be a Cummings Type K, 6-cylinder, 4-cycle, full diesel engine of 170 horsepower fitted with electric starter and arranged for full pilot house control. The propeller shaft will be of monel metal and the propeller of stainless steel. A 2½-kilowatt oil engine driven generating set will supply lights and auxiliary power.

Comfortable accommodations will be provided for 15 persons including crew. The inside of the steel hull will be lined with a special type of insulation that deadens sound and protects against heat and cold. All plating is sand blasted and pickled by a rust proofing method before being installed in the hull. All decks will be covered with non-skid rubber cemented to the steel plating.

It is claimed that this type of construction is adaptable to all workboat hulls and that it will produce a stronger and lighter hull at less cost than is possible either with wood or with riveted steel.



Quartering view of all-welded steel yacht under construction with bottom partially plated. Note I-beam keel extending forward. This will be cut off flush when vessel is finished.

Monel Absorbs Vibration

RECENT experiments with the mounting of marine gasoline engines in cruisers indicate that Monel Metal has the very unique property of absorbing vibration to a marked degree.

The discovery of this quality in Monel Metal came about through the installation of a 200-pound, 1500 revolutions a minute, gasoline motor in a stock model canoe. This engine, connected to a 12-inch propeller, developed decided periods of vibration. The engineers making the installation decided it would help if the stiffness of the base stringers could be increased. So the wooden frame work was pulled out and replaced with a chassis of Monel Metal, Monel Metal being chosen for its strength and non-corrosive quality. There was no thought of absorbing the entire vibration; simply of distributing the strains through the entire frame work of the boat.

On the trial trip it was found that the new Monel stringers were accomplishing two very fortunate results. First the greater rigidity of the Monel Metal as compared with wood practically eliminated

(Continued on Page 29, Blue Section)

Improvements at Port Tacoma

After almost two years of planning, specifications have been prepared and bids called for a new $250,000 cold storage warehouse to be erected on a site adjoining the big transit shed on Pier 2, of the Port of Tacoma.

The Port of Tacoma Commission will build also a 1,500,000 bushel grain elevator on an entirely new pier, known as Pier 3, which, together with the cleaning and separating department of the elevator plant, will involve an expenditure of about $750,000. Financing of the new pier, cold storage plant, and elevator was accomplished at the last district election, at which time voters overwhelmingly approved the two projects. These new units, when completed, will give Tacoma its first waterfront cold storage plant and its first bulk grain elevator storing and transit facilities. Situated at the mouth of the fertile Puyallup Valley, the cold storage plant will have the tremendous berry crop of this famed region to draw upon in addition to the apple crop of the Wenatchee and Yakima Valleys.

The grain elevator will be built in units, the first one containing thirty concrete bins, a dumping shed, and a cleaning and pumping department housed in a building nearly 200 feet high, with ample capacity to care for an enlarged storage system in the future. This plant will be located on a new 600 foot pier to be built straight out from the base of pier 1. The total cost of the three improvements will be over $1,000,000, and will give Tacoma the finest public pier system on Puget Sound.

Aerial view of Port Tacoma Piers. New cold storage unit will be built on open area back of pier shed on Pier 2, upper center. The new pier and grain elevator will project 600 feet from bulkhead at right lower center to the right of the railroad tracks.

California Deepsea Fisheries

FOR several years the fishing fleets of southern California have been cruising further asea in search of tuna, shipjack, yellow tail, and albacore to feed the rapacious maw of the great fish canneries and reap large profits for their operators.

On the 19th of July, the Glen Mayne, 142-foot, twin-screw, diesel motorship, and largest of the bait boat fleet, left on a prospecting cruise for Hawaiian waters under command of Captain C. W. Nickerson. This cruise is being financed by the California Packing Corporation and will survey the prospects for commercial fisheries at all the banks lying between the California coast and Hawaii. The Glen Mayne has a cruising radius in excess of 10,000 miles. Her two 350-horsepower Atlas diesels give her a speed of better than 12 knots. She carries 25 tons of live sardines for bait and can stow 300 tons of fish in crushed ice. To keep this cargo cold she is equipped with a 5-ton Lippman ice machine.

It is said that several more of the larger boats will make offshore prospecting cruises this summer.

This is the natural development in all sea fisheries. Intensive fishing in shore waters drives the fish out to the deepsea banks, and the fishermen follow.

General view of the new moorings built by the Port of Tacoma to handle the extensive fishing fleet operating out of that port. About 25 large fishing vessels can be accommodated here. The Western Boat Building Company and the Coast Line Shipbuilding Company are seen in the background.

Mariners were well pleased with the announcement that the government will supply 41 Class B spar buoys, which will be placed by the Port Commission of Aberdeen, Washington, in the main channel of Grays Harbor to make navigation safer in the inner channel.

Rapid Growth of the Port of Bellingham

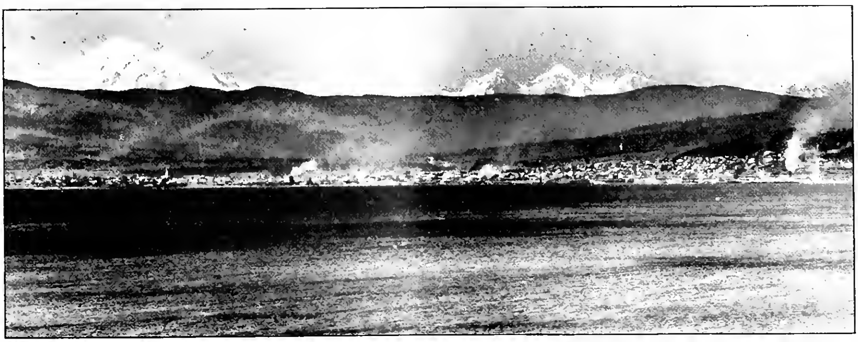
By Chas. F. A. Mann.

JUST below the Canadian boundary, nestling at the foot of the long ranges of hills and mountains of the Cascade system, and facing the broad reaches of northern Puget Sound, lies the city and port of Bellingham. Formed many years ago as a milling center made up of three scattered communities bordering Bellingham Bay, this thriving seaport has recently set a rapid pace that has attracted wide attention, definitely placing itself among world ports. Only eight years ago barely a half million tons of cargo moved over its docks into the holds of coastwise and transpacific boats. During that short interval a gain of almost 500 per cent. has taken place and, during 1928, 2,329,446 tons of cargo valued at approximately $30,000,000 passed through its docks.

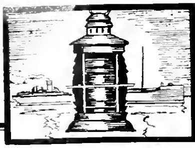
Aerial view of the docks at Bellingham.

Unusually situated, Bellingham has become the center of a diversified industrial program hardly equalled by other Pacific Coast ports. Located in the heart of the city is a coal mine producing 2000 tons of coal a day; the only tidewater sugar refinery north of San Francisco Bay; the home of one of the world's largest fishing and fish canning organizations; a huge cement plant turning out 3000 barrels of cement a day; two large paper mills; and, of course, the large typical Puget Sound lumber mills, including the Bloedel-Donovan organization with a capacity of a million feet and 750,000 shingles daily. A rich agricultural region nearby with many large canneries in addition to a vast dairying organization round out Bellingham's industrial structure by an annual production of over $15,000,000 worth of products.

As in other far Northwest ports, the port commission has set the pace in deepwater harbor development. The Port of Bellingham Commission took hold of the harbor situation in 1924 and, with a $250,000 public bond issue and $150,000 subscribed by private citizens, acquired the old municipal wharf and by degrees about 252 acres of tidelands for mooring, pier, and industrial sites development. Since that time the facilities have been completely modernized with two transit sheds and an open pier. About $700,000 is now invested in public terminals with ample room for any commodity or ship. Work has been started on the dredging of Squalicum creek, involving the moving of about 100,000 cubic yards of material, which will provide moorings for small craft. This, together with other improvements to the port properties under way this summer, will cost about $50,000. Officers of the port commission are R. A. Welsh, chairman; H. W. Hunter, secretary; G. W. Knihel, port engineer; and O. N. Munn, manager.



Beautiful view of Bellingham across the bay. Mount Baker in the background.



Auxiliaries—Ship Supplies—Marine Equipment

Electrified Auxiliary Machinery of New South African Line Motorship

By Robert W. Clark,
Westinghouse Electric and Manufacturing Company.

ALL auxiliary machinery of the new American South African line twin-screw motorship, now building at the yard of the Sun Shipbuilding & Dry Dock Company, will be electrically driven. Westinghouse Electric & Manufacturing Company will supply the motors and control for deck and under deck machinery, as well as the three 220-kilowatt diesel-driven generators which supply the auxiliary power.

A general description, profile and deck plans of this vessel were published in the July issue of Pacific Marine Review. She is powered with two 4-cylinder Sun-Doxford diesel engines developing 5000 horsepower and driving the hull at 14 knots.

Deck Machinery

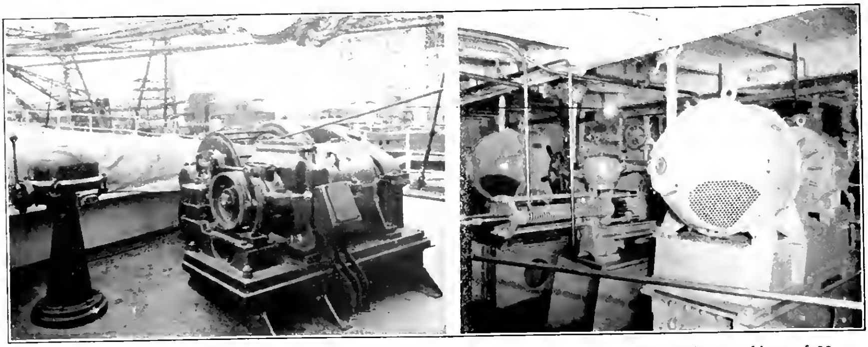
The electrically driven deck machinery includes the steering gear, anchor windlass, cargo winches, and warping winch. The steering gear, which is not exposed to weather, is driven by a drip-proof, semi-enclosed, self - ventilated motor of 30 horsepower. The anchor windlass, driven by a water-proof motor of 65 horsepower, is equipped with a water-proof brake and magnetic control. There are fourteen cargo winches, twelve of which are driven by 25-horsepower motors and two by 30 horsepower motors. The winches are equipped with snap action control and water-proof brakes. The warping winch is driven by a 30-horsepower, water-proof motor, has a water-proof brake, and is operated by a magnetic type control.

These Westinghouse water-proof deck motors are of the most rugged type built. The frame is of cast steel, split horizontally to facilitate the removal of the armature. The feet are cast integral with the lower half of the frame and are widely spaced and ribbed for strength and rigidity.

Armatures are made small in diameter to reduce the moment of inertia. The armature coils are form-wound of asbestos covered strap, insulated with mica and asbestos tape. The assembled armature is dipped and baked several times in insulating varnish. Shafts are of axle steel, large in diameter, and ground to dimensions. They have tapered extensions with nut and lock washer at each end to facilitate removal of pinion and brake wheel.

Bearings are of the sleeve type, babbitt lined. They are supported rigidly between the two halves of the frame. The journals are lubricated by means of oil rings. Stuffing boxes with graphitized asbestos packing are used to prevent the leakage of water along the shaft. Leak-off traps are also provided inside the stuffing boxes to drain off any water which might work its way through the stuffing box and get into the bearing oil.

All details combine to produce motors noted for their reliability, ruggedness, heavy overload capacity, quick starting and stopping characteristics, and water-tightness. All of these contribute to low



25-horsepower, Westinghouse, water-proof motor driving cargo winch is shown at the left. On the right, two drip-proof 30-horsepower Westinghouse motors driving hydraulic pumps for operating the steering gear.

maintenance costs and long and effective service.

The engine room auxiliaries and other under deck auxiliary machinery, all of which is electrically driven, comprise the following:

No. Motors	Application	H.P.
2	Main air compressors	65
2	Main engine turning	20
1	General service and fire pump	40
1	Salt water circulating	50
1	Fresh water circulating	50
1	Fire and bilge pump	40
1	Sanitary pump	15
2	Lubricating oil pumps	12.5
2	Fuel oil transfer pumps	7.5
1	Engine room bilge pump	7.5
1	Bilge and ballast pump	50
1	Fuel oil purifier pump	7.5
3	Fresh water pumps	3
2	Lubricating oil separators	2
2	Fuel Oil Separators	2
2	Fuel oil pumps	2
1	Refrigerating machine	5
1	Machine shop	7.5

All of the foregoing motors are of the drip-proof, semi-enclosed, self-ventilated type, with the exception of those which drive the main engine turning gear and the lubricating and fuel oil separators. These motors are of the totally enclosed type.

The Westinghouse drip-proof, semi-enclosed, self-ventilated motors are designed primarily for marine service and provide complete protection of the electrical parts from the moisture and dripping water so often encountered in underdeck service.

The motors are totally enclosed on the top half and semi-enclosed on the bottom half. The rear or pulley end brackets are cast solid on the top, while the top openings of the commutator end bracket are fitted with gasketed, cast iron covers which fit against flat surfaces. Sheet steel, semi-enclosing covers are provided for all openings below the horizontal center line. A fan on the motor shaft draws air in through the perforated covers on the lower half of the rear bracket and discharges it through the perforated covers on the lower half of the front bracket. This insures a positive and ample circulation of cooling air and results in a motor with dimensions only slightly larger than an open-type motor.

All field coils and armature windings are treated with moisture resisting compounds and all parts subject to rust are sheradized. These motors have established enviable records in marine circles and their performance in service clearly indicates the wide experience and careful attention to details which have been put into their design and construction.

Arc-Welded Steel Motor Boats

By John Van Horne, Field Engineer, The Lincoln Electric Company

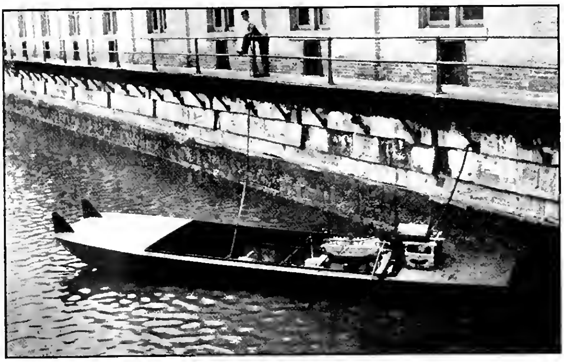
THE Corps of Engineers, United States Army, is now building a group of three arc-welded steel motorboats for use as carriers and towboats on the Mississippi River and its tributaries. This is the second fleet to be so constructed. The first fleet of seven was launched over a year ago and has been in continuous service ever since.

The launches are constructed entirely of steel, all permanent connections being made by the electric arc-welding process. The over-all length of each craft is 28 feet; the breadth, 7 feet; and the depth, 2 feet 4½ inches; the freeboard, of course, varies with the load, the draught being very light when the boat is not loaded. The boats have flat bottoms, slightly stepped close to the stern, and have a rather sharp rise at bow effecting a broad, flat prow, similar to the seaplane type.

Some idea of the construction of these boats may be gained from the accompanying illustration. Each rib is made from one piece of channel iron, 1½- by 9 16- by ¼-inch, with the exception of the frame at the rear end of the forward bulkhead which is of 1½- by 1½- by 3/8-inch angle iron. The two floor stringers are 3- by 3- by 3/8-inch angles punched and bolted in position to each frame prior to arc-welding. Angle iron stringers are also welded to each side of the channel frames, and these stringers are punched and bolted to the frames to maintain perfect alignment until arc-welded. Deck beams over the fore and aft bulkheads are 1½- by 1½- by 3/8-inch angles, arc-welded directly to the top ends of frames. Clamps formed from flat plate are arc-welded to every other frame to carry the deck on both sides of the open cockpit.

The engine base or mounting is constructed entirely from ¼-inch steel plate, fabricated by arc-welding and permanently joined to the floor or bottom of the craft and to the two floor stringers by arc-welding. The engine base is braced on two sides by triangular pieces of steel plate with bottom edges crimped and arc-welded to the bottom plates. The coaming around the cockpit consists of one piece of 2- by 2- by ¼-inch angle on each side and end. The forward bulkhead is fabricated by riveting, so that it may be removed when desired.

The bottom and side plates are joined to the frames by short fillet welds about 1½ inches long and approximately 7 inches apart. The bottom is of ¼-inch plate, the sides of 3/16-inch plate, and the deck of No. 10 gauge sheet steel. Continuous welds join the edges of bottom side and deck plates. The bumpers



All-welded, 28-foot, shallow draft, light weight towboat designed and built by United States Army Engineers for river use.

at the bow of the boat are for pushing barges. They are constructed of 8- by $13\frac{3}{4}$-inch channels, braced by triangular pieces of 3 16-inch plate, and 2 by 2 by 3 16 angles attached to the deck and prow by arc-welding.

Each boat is to be powered by a 125-horsepower, 6-cylinder, gasoline engine equipped with a reduction gear having a ratio of 3 to 1. With this arrangement the boats obtain an average speed of approximately 13 miles per hour when running light.

The unique design and construction of these boats is a distinct tribute to the ingenuity and engineering skill of the Engineers Corps. The success of the design and construction of these arc-welded all-steel motor launches, proved after a year's operation, marks a distinct step towards a new method of building power boats which will undoubtedly affect the entire industry. The electric arc-welding process makes a steel hull literally one piece of steel—which means a stronger, more durable craft absolutely free from leakage.

Rustless Steel Propellers

Key System Ferries Demonstrate Value of New Material for Propulsion Screws

ABOUT three and a half years back, the Key System Transit Company started an experiment that, judging from experience to date, should be very interesting to every ship operator.

The Key System operates passenger ferries across San Francisco Bay and electric interurban and city street car systems in the East Bay cities. Its active ferry fleet consists of four turbo-electric, steel, double-end screw, passenger ferryboats, on all of which the forward and after propellers are independently driven by electric motors. Two of these boats, Yerba Buena and Peralta, are acknowledged to be about the last word in comfort, convenience, and efficiency for this type of ferry. These ferries land their passengers on the east side of the bay at a long pier, and the pier trackage is limited; so that trains are run on very close headway. It is therefore very important that ferry schedules be closely kept.

As originally designed and built, the two steel ferries Hayward and San Leandro were equipped with cast steel propellers, 4-bladed, 9 feet 3 inches diameter. These wheels were unsatisfactory. Following edges eroded and corroded very quickly; so that in a few months the propulsive efficiency of the wheels was noticeably lower and the boats were hard pressed to keep schedules. In fact these boats had to be docked every six months and the following edges of propeller blades built up by welding.

On February 10, 1926, a Calmar electric rustless steel wheel, cast from the same pattern as the original wheels, was delivered to the Key System Transit Company by the Warman Steel Casting Company of Los Angeles and was installed on one end of the ferry Hayward. After a few months operation it was apparent that while the old cast steel wheel was rapidly losing efficiency the rustless steel wheel showed no perceptible change. On docking the vessel February 19, 1927, the cast steel wheel had to be removed on account of corrosion, but the rustless steel wheel, to use the words of a prominent Key System official, "looked as though it had been in the water not more than thirty days, the grinding and tool marks being still quite visible on its polished surface." Another Calmar rustless steel wheel was installed in place of the cast steel wheel, and these two propellers are still going strong with no perceptible lessening of efficiency or marring of surface.

Having thus demonstrated the adaptability of the material, the engineering departments of the Key System Transit Company and the Warman Steel Casting Company undertook some research and testing so as to be able to take full advantage of the qualities of Calmar steel in this new application. Tests made under the supervision of the American Bureau of Shipping indicated an ultimate tensile strength of 79,526 pounds, and elongation of 43.5 per cent., and an ability to bend without sign of fracture on a 1-inch radius through 120 degrees. This showing allowed the designer to assume 76,000 ultimate tensile strength in his design formula and gave a somewhat thinner blade in the wheels of the Yerba Buena and Peralta, thus assuring better initial propulsive efficiency. The wheels on these vessels are 10 feet in diameter and are four bladed.

Key System officials express great satisfaction in the new Calmar rustless electric cast steel and go so far as to say that the propellers made from this material return to them their entire cost every two years in the saving of expense due to the pulling and repairing of the old wheels, without considering dry-docking, slowing up of schedules, or wasted fuel through loss in propulsive efficiency. One official declared that were all these latter items included, the rustless steel wheels would pay for themselves several times a year and that, barring accident, these wheels seemed good for the life of the ships.

In the latter connection, a recent development in welding now assures any user of rustless steel prompt and economical repairs for any accidental fractures of parts made from this material.

Calmar rustless electric cast steel is made by the Warman Steel Casting Company of Los Angeles. Cordes Brothers represent the Warman Steel Casting Company at San Francisco.

ELECTRIC PAYING SHELL

A DISTINCT advance was made in the method of applying marine glue to deck seams during the construction of the Hi-Es-Maro, H. E. Manville's new $1,000,000 pleasure yacht, launched June 7 at the shipyards of the Bath Iron Works, Bath, Maine, when for the first time an electric melting pot and an electric paying shell were used to pay the deck seams.

Over a ton of Jeffery's No. 1 yacht marine glue was applied using Schleuter's electric paying shell. For over three-quarters of a century Jeffery's glues have been applied by ladle or an unheated paying shell. The combination of Jeffery's marine glue and a container that keeps the glue in good workable condition is a perfect one.

No expense was spared to make the Hi-Es-Maro the last word in yacht construction. She was designed by Henry J. Gielow, Inc., is 266 feet long, 35 feet beam, and 22 feet depth. She is powered by two Bessemer diesel engines of 1200 brake horsepower.

Worthington Timken-Equipped Compressors

A NEW line of compressors, employing Timken roller bearings on the main crank shaft journals, recently has been announced by the Worthington Pump and Machinery Corporation. This is the single horizontal straight line series, so popular among smaller users of compressed air. Capacities range from 100 to 300 cubic feet per minute and, operating at moderate speeds, maintenance charges and attention are said to be almost completely eliminated.

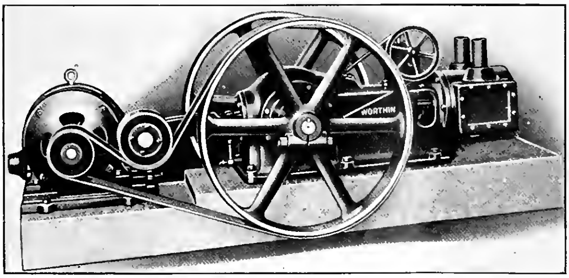
As compressors of this type and capacity usually are used by the smaller power plants, many of which do not have skilled operators, the elimination of bearing adjustments has removed the principal item of worry and expense.

Oil rings, which deflect the surplus oil and return it to the crank case, are mounted on the shaft outside the Timken bearings. A special feature is the design of the crank case enclosure. This is completely free from oil leaks usually found in equipment of this kind.

Feather valves are standard equipment on these machines, as on all Worthington air and gas compressors. These valves are light strips of steel, approximately 1/32-inch thick, which flex when opening against a curved guard to permit the passage of air. They are said to be the lightest and simplest air valves in use.

Regulation may be by an automatic starter and pressure switch mounted on the motor, stopping and starting to control the air pressure between definite limits. Or a pressure regulator may be attached to the compressor inlet valves, holding them open to maintain constant air pressure. Compressors with the latter type of unloader, which bypasses the air back to suction, are claims never to overheat when unloading.

These compressors can be furnished with ball bearing idlers for short belt drive; with Texrope drives, using V-type ropes; or a synchronous motor may be directly mounted on the compressor crank shaft, eliminating transmission mechanism.



One of the new line of Worthington roller bearing compressors.

Alfite Portable Fire Extinguishers

PRODUCTION on Alfite (carbon dioxide) portable hand extinguishers has just been started by the American-LaFrance & Foamite Corporation of Elmira, it is announced by officials of the company.

These extinguishers, which have demonstrated their effectiveness in actual service and during an extended series of tests at the company's experimental station at Utica, New York, are being produced in 7½- and 15-pound sizes. They are easily portable and are applicable for a variety of hazards. Some of these include fires in electrical switchboards and in other electrical equipment, including small generators and relay equipment. Alfite extinguishers are also specially adapted for extinguishing fires in gasoline, fuel and motor oils, as well as in paints, varnishes, and alcohol.

Alfite gas, as contained in these two portable extinguishers, as well as in the larger stationary units manufactured by the American-LaFrance & Foamite Corporation, is a special grade of carbon dioxide gas which is sealed in the cylinders in a liquid state. When the extinguishers are actuated by raising a control handle, a plunger ruptures a copper disk and allows the liquified gas to escape. When it reaches the air it immediately turns into carbon dioxide gas and expands about 450 times. Being a gas, Alfite gas is three-dimensional in its properties and, accordingly, is able to penetrate every crack and crevice, diluting the oxygen content of the air to such an extent that combustion is impossible and the fire is snuffed out almost instantly. Maximum efficiency is assured in all Alfite extinguishers because of the fact that their construction makes them freeze-proof and their specially constructed valve guarantees against leakage.

Both models of Alfite hand extinguishers are equipped with a cone shaped horn designed to provide the maximum concentration of Alfite gas at the point of the fire. The 15-pound extinguisher is provided with a control valve which enables its operator to conserve the supply of gas while he is attacking the fire.

Chief among the numerous advantages of Alfite gas as a fire extinguishing agent is the fact that it does not damage anything with which it comes in contact, whether electrical equipment, metals, fabrics, or even perishable foods. Likewise, there is no residue to clean up after the fire has been extinguished, a big advantage in itself. When used to combat electrical fires, Alfite gas also offers a big advantage, for besides being a nonconductor of electricity it will not damage insulation.

Carbon dioxide gas is often confused with the deadly carbon monoxide gas. Despite their similarity in name, there is no relation between the properties of the two gases, for carbon dioxide gas, as used in the Alfite extinguishers, is absolutely harmless, except as it may reduce the oxygen content of the air below that necessary for breathing.

Safe Navigation

Instantaneous Soundings by Fathometer of Great Value to the Navigator

THE fundamental requirement of the safe navigation of any ship has been and always will be to have sufficient water beneath the keel.

Hydrographic charts are part of the essential equipment of every ship. The establishment of accurate water depths upon these charts is the result of continuous work on the part of hydrographic surveys of all maritime nations. Immense sums are expended yearly to give navigators the latest and best information obtainable as to changes which have occurred in the formation of the bottom on trade routes of the world.

The master of every vessel lays the shortest route upon the latest chart in order that he may deliver his cargo in the shortest possible time with maximum safety. The charts which are now used depend for their accuracy upon the most modern device for making rapid and correct observations of water depth.

The apparatus, known as the Fathometer, is standard equipment for the majority of the survey ships of the United States Coast and Geodetic Survey and is available commercially for all merchant ships.

In order to make the best use of marine charts it is necessary to know at any and all times the correct water depth over the ship's course. The instantaneous, automatic, visual echo-depth soundings of the Fathometer give continuous assurance to the navigator that he is on his charted course.

The following statement made by Captain W. E. Parker of the United States Coast and Geodetic Survey with reference to the Fathometer, with which all of the larger ships of the Survey are equipped, is indicative of its value to navigation as a safety and a time saving equipment:

"A merchant ship equipped with this apparatus should be able to make port during thick weather or avoid dangerous shoals by soundings alone. Given an adequate chart, the master should be able to spot his position at any time by a comparison of a set of echo soundings with the charted depths and lay his course with at least as much confidence as from astronomic sights."

Unified Control for Stable-Arc Welding

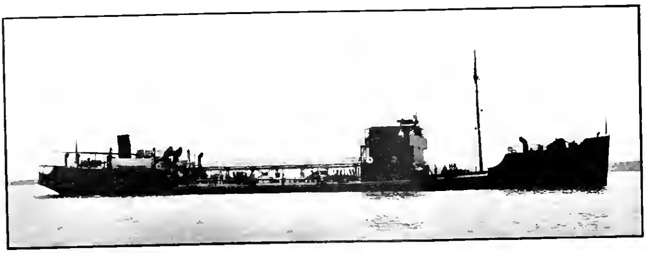
IN the new improved Lincoln Stable-Arc welders, manufactured by The Lincoln Electric Company, Cleveland, recently placed on the market, many new features of design and construction increasing the stable arc features are introduced.

The unification of the controls of both motor and generator is one of the outstanding features. The working mechanism of all controls are contained in a ventilated enclosed steel cabinet with hand regulators and switches mounted on a panel which forms a side of the cabinet. The control panel contains rheostat regulator, diverter switch, safety starter switch, volt-ammeter, and wing nut terminals for cables. This unified control greatly increases the simplicity of the operation of the welder. The control cabinet is mounted directly over the motor generator for easy access by the welding operator. This permits removal of the motor generator armature without disturbing any other parts.

The use of a combined voltmeter and ammeter, known as a volt-ammeter, makes possible the reading of amount of voltage and amperage on one dial and eliminates the use of the separate delicate ammeter which would be given excessive wear on a Lincoln welder, due to the large output keeping the ammeter jammed against the high limit pin on the dial. In this way the volt-ammeter insures longer instrument life. The face of the volt-ammeter is mounted flush with the control panel, assuring the utmost protection possible.

Terminals for the lead cables are equipped with winged nuts, a feature which makes quick and easy connections possible, especially when it is desired to reverse the polarity of welding current. The use of these wing nut terminals also eliminates the necessity of a switch for reversing polarity. The Lincoln safety push button switch is incorporated in the control panel for starting and stopping of the welder. With this type of safety switch it is an impossibility to accidentally start the welder.

Enclosed wiring of all operating controls as well as a metal backed rheostat are the result of the use of a unified control cabinet. The mounting of this cabinet over the motor generator permits the use of a shorter chassis frame or base than used in previous models. The shorter base offers the advantage of less floor space occupied by the welder as well as a smaller turning radius in the portable models.



Diesel-electric coastwise clean oil tanker Tidewater. A full description of this vessel and her machinery were published in the June issue of Pacific Marine Review. She was built by The Pusey & Jones Corporation. Her electric propulsion plant was furnished by the General Electric Company and her engines by I. P. Morris-De La Vergne, Inc. On trial she easily maintained the requirement of 10½ knots speed.

Trade Literature

General Electric Company, headquarters at Schenectady, New York, has just issued an interesting little leaflet describing briefly **G-E Industrial Heating Devices.**

The following bulletins on General-Electric motors are now available:

GEA-394-A—Induction motor-generator sets;

GEA-874-D—Type WD-200-A arc welder;

GEA-875-D—Type WD-300-A arc welder.

An interesting little booklet is also available on request describing the General-Electric Arc-Welding School and its conduct at Schenectady for the instruction of men interested in perfecting themselves in the art of arc-welding.

City of Portland (Oregon) Annual Report of The Commission of Public Docks—1928 statistics—has been received, and we find it up to the usual high standard of port annual which we are accustomed to receive from this source. The book is paper bound, of convenient size, and is printed on fine coated stock, with many illustrations of port facilities and activities, fine diagrams and maps, and the usual port statistics in tabulated form.

In addition there are many pages of text devoted to the history of the development of this river port, the source of its wealth and prosperity, and its potentialities, all of which make very interesting and instructive reading.

Uehling Instrument Company, 473 Getty Avenue, Paterson, New Jersey, has published a new six-page bulletin No. 150 describing the Uehling combined barometer and vacuum recorder which is an excellent instrument for steam turbine operation. It is a most dependable instrument and gives a turbine operator "something to shoot at," in that it shows the absolute back pressure at a glance and enables him to maintain the highest vacuum possible for a given barometer reading. It also gives a picture of operation, shows the exact time when anything happens to cause a drop in the vacuum, and enables one to correlate the factors that might have caused the interruption in service. It gives the whole story of condenser performance on one chart.

The Board of Engineers for Rivers and Harbors of the War Department and the Bureau of Operations of the United States Shipping Board have just issued a report on **Port and Terminal Charges at United States Ports.** The report gives data pertaining to such subjects as pilotage, port warden's fees, electric current, fuel, stevedore and labor charges, agency fees, wharfage, towage, and other services and charges at the individual ports, with information respecting the physical features and commerce. The volume is divided into two parts, part 1 containing the charges of the United States government and the more important governmental regulations affecting the movement of vessels, freight and passengers, and part 2 containing the detailed charges by ports, prepared under a uniform arrangement.

These data are published in Port Series reports covering some 70 of the important ports of the United States. Owing to the impracticability of revising all of these volumes frequently, the present volume is issued to meet the demand for current information on the important services and charges likely to be encountered in handling goods through our ports. It is published as No. 1 of a "Miscellaneous Series" of reports to be issued from time to time, which will present authentic data covering various subjects pertinent to the movement of American products in national and international trade.

Wood Construction is the title of a booklet just prepared under the auspices of the National Committee on Wood Utilization of the Department of Commerce. It was prepared by Dudley F. Holtman, the committee's construction engineer, for the benefit of lumber manufacturers and exporters in checking up on the uses of lumber and its products in foreign fields and to permit domestic manufacturers to adjust their merchandising methods to fill satisfactorily the needs of foreign and home consumers.

The book contains complete information in regard to the properties and uses of the principal American woods and standard methods of wood preservation and uses, methods of grading, methods of finishings, etc. The most important part of the book, according to the Department of Commerce, is a section dealing with actual construction methods for everything from wooden railway bridges to concrete form work, and from interior finish and millwork to construction methods as applied to dwellings and mill construction.

The Department of Commerce recommends that manufacturers, exporters, and shippers of lumber products distribute this book in the foreign field with the object of intelligently educating customers in the proper uses of American lumber and wood products.

The Black Horse of the Sea, by Robert D. MacMillen. From the press of Joseph D. McGuire, New York.

This is an excellently edited, beautifully illustrated book in sea green board covers describing the salvage and contracting equipment and work of the Merritt-Chapman & Scott Corporation.

The house flag of Merritt-Chapman & Scott Corporation is a running horse in black on a white ground. This flag now floats over more than 100 vessels of various types. The origin of the black horse flag is interesting. In the good old days salvage service was largely in the hands of marine underwriters. Agents of these underwriters were maintained at strategic points along dangerous coasts with instructions to keep sharp lookout and at the first sign of a vessel in distress to get word to headquarters immediately, "even if you have to kill a horse."

So the rush of a wildly ridden horse came to symbolize marine salvage to all coast dwellers, and this symbolism is perpetuated in the house flag of one of the world's greatest salvage organizations.

In very fascinating style, "The Black Horse of the Sea" tells of the many and varied exploits of the Merritt-Chapman & Scott organization in saving lives and property, in handling great weights easily, in building outfall sewers, great bridges, breakwaters, and installing subaqueous waterpipes.

Copies of the book may be obtained from Merritt-Chapman & Scott Corporation.

Trade and Organization Notes

MERRICK ELECTED WESTINGHOUSE PRESIDENT

F. A. MERRICK, an executive well known within the electrical industry, was elected president of the Westinghouse Electric and Manufacturing Company by the board of directors of the company, meeting in New York City, Wednesday, June 26.

In announcing the election of Mr. Merrick to the presidency of the company, A. W. Robertson, chairman, also stated that the board of directors, while accepting the resignation of E. M. Herr, president since 1911, in order that he might go on an extended vacation, had elected Mr. Herr vice-chairman.

Mr. Merrick advances into the position of president from the position of vice-president and general manager of the Westinghouse Electric & Manufacturing Company. He is a native of New Jersey and received his technical education at Lehigh University. Shortly after his graduation he was employed by the Steel Motors Company, a subsidiary of the Lorain Steel Company, where he was responsible for many important electrical inventions and where he held the position of manager and chief engineer.

In the acquisition of the Steel Motors Company by the Westinghouse company, Mr. Merrick entered the Westinghouse organization. He was immediately selected to prepare plans for a plant in Canada and, upon the formation of the Canadian Westinghouse Company, Ltd., in 1903, was sent to the Dominion as superintendent of the company. In this position his ability for organization was quickly recognized. In turn he became manager of works and later vice-president and general manager of Canadian Westinghouse Company, Ltd.

In the World War emergency, Mr. Merrick organized the operations of the New England Westinghouse Company, at Chicopee Falls, Massachusetts, to manufacture rifles for the Russian government, and later for the United States. In this connection he completed an order for 60,000 Browning machine guns within eleven months after operations were begun, a manufacturing achievement since generally regarded in the industrial field as being without parallel. After the war, he was located in London for two years as special representative of the Westinghouse Electric International Company, later returning to Canada to resume his duties as vice-president and general manager of the Canadian Westinghouse Company, Ltd.

These achievements of Mr. Merrick won for him in January, 1925, the position of vice-president and general manager of the Westinghouse Electric and Manufacturing Company, with headquarters in East Pittsburgh. In June, 1925, he was also elected a director of the company.

NEW SALES MANAGER FOR COEN

J. T. Voorheis, recently reappointed general sales manager of the Coen Company.

J. T. Voorheis has recently been reappointed general sales manager for Coen Company after an absence of four years from the oil-burner industry, during which time he was engaged in the manufacture of equipment for the concrete products business.

Prior to his resignation in July, 1925, Mr. Voorheis had been with Coen Company for ten years in the capacity of engineer and later sales manager, during which time he contributed a number of improvements to the art of oil burning.

Mr. Voorheis has just returned from an extended trip throughout the eastern states, where he visited the Coen Company's New York office and various agencies. While in New Orleans, arrangements were made whereby Richard H. Miller has taken over the Coen Company agency for marine business at that port.

The Coen Company maintains offices in San Francisco, Los Angeles and New York, and is represented by the following nation-wide chain of agencies:

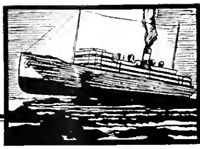
Fanning Engineering Corp., Mobile; Alfred J. Hunter Co., Muskegon, Mich.; J. D. Rankin Co., Chicago; J. D. Robinson Co., Savannah; Frank H. Southall, Glenside, Pa.; Merritt M. Stone, St. Louis; R. J. Taylor Co., Baltimore; Richard H. Miller, New Orleans; Ben Blum & Co., Galveston; E. B. Huston, Portland, Ore.; V. S. Jenkins Co., Seattle; San Pedro Rubber & Supply Co., San Pedro; John Zink Co., Tulsa.

Negotiations have been completed by the **Newhall Chain Forge and Iron Company** of Park Place, New York, for the purchase of the chain shop and other buildings of the Rensselaer Chain Works at Rensselaer, New York, near Troy, an old established chain manufacturing plant, together with adjoining properties to permit of extensions.

The Rensselaer chain shop is equipped particularly for the manufacture of the better grades of hand made, heavy duty chains and has been under the exclusive operation of the Newhall Company for a number of years, where they have manufactured the well known brand of Warwick dredge, crane, conveyor, and sling chains, together with some of their well known special Trident steel loading and dredge chains.

Benjamin R. Smith, who all his life was well known in the chain industry and who was superintendent of the Rensselaer shop while it was under the operation of the Newhall Company, passed away in his eighty-third year on June 14.

Mr. Smith was active in the shop to within a week of his death, and his place has been taken by his son, Samuel Smith, who has been a practical chain maker all his life.



Marine Insurance

Edited by JAMES A. QUINBY

The Warranty of Seaworthiness

Its Place in Modern Marine Policies

IF you care to get an earful of voluble misconception in regard to a fundamental principle of marine insurance, just sneak up casually on a group of marine men discussing seaworthiness. When is a boat seaworthy?—and if so, how does this affect the time hull policy?—the bill of lading?—the cargo policy?—the P. & I. policy, or what have you?

Wherefore we have decided to set down a few of the ABCs of the matter. If the subject interests you, you can cut it out and file it carefully in the starboard after quarter of your waste-basket, where such things are usually filed.

Mistaken Identity

(News Note: "The master of the ill-fated vessel explained that he mistook . . . . . Head Light for the lightship in the channel.")

The watchman at the city hall exclaimed aloud in fright,
As through the darkness he beheld an awe-inspiring sight,
A full-rigged ship, with stun's'ls set and running lights agleam,
Dashed up the marble steps and struck the city hall abeam.

"My God," the captain shouted, as he stepped upon his brake,
"Excuse it please, I plainly see I've made a slight mistake.
Although I've worked this beat for years, asailin' ships at night,
I thought your watchman's lantern was the Point Bonita Light."

Now I have heard of ships that steer by echoes in the fog.
And barks that set their courses by the barking of a dog.
But the seaman's most prevailin' epitaph is one that tells
How he mistook a headland light for a lightship some place else.

J. A. Q.

Origin of the Warranty

The warranty of seaworthiness in a hull policy is not expressed, but is implied from the general duty of an assured to furnish a subject of insurance which is in a fit condition to withstand the perils insured against. In this respect, it arises from the same principle which prevents an insurer from being liable for the inherent vice of goods insured under a cargo policy.

In the good old days when men were men and a sturdy ten-ton stem-winder was lucky to get from here to there, it was customary to issue voyage policies on hulls. From this quaint custom arose the galaxy of terms such as "terminus ad quem" and "change of voyage," without which the average textwriter could not exist. Voyage policies upon hulls have practically ceased to exist, save where a vessel, long laid up, is to make her swan-song voyage to a port of breaking up. In such a policy there is a warranty that a vessel must be seaworthy at the start of the venture. As in all such requirements, however, the warranty may be dispensed with by express stipulation.

In Time Policies

Under English law, it is generally conceded that there is no warranty of seaworthiness under a time hull policy. The Marine Insurance Act of 1906, Sec. 39, (5) provides that "In a time policy there is no implied warranty that the ship shall be seaworthy at any state of the adventure, but where, with the privity of the assured, the ship is sent to sea in an unseaworthy state, the insurer is not liable for any loss attributable to unseaworthiness." (And, we might add, if you think it's easy to prove privity to unseaworthiness, just try and do it.)

In the United States, however, (save in policies providing for English law and usage) a vessel is warranted by her owner to be seaworthy at the inception of a time hull risk, if she is then in port. This same principle of general maritime law is set forth in the California Civil Code at Sections 2681 and 2683, and recognized in Union Insurance Company v. Smith, 124 U. S. 497, where the Supreme Court says, "In the insurance of a vessel by a time policy, the warranty of seaworthiness is complied with if the vessel be seaworthy at the commencement of the risk."

This warranty of seaworthiness is, we think, somewhat modified in policies bearing the Inchmaree clause, which, among other things, agrees to bear the damages resulting from latent defects. Even if it were shown that a latent defect existed in the vessel at the time of the issuance of the policy, she would still be covered, since this clause would seem to have the effect of excluding latent defects from the requirements of the warranty. It remains only to define a latent defect. As several capable gentlemen have spent some thirty odd years on this job without success we won't tackle it at this time.

It is perfectly plain, however, that under both American and English law there is no warranty of seaworthiness as to voyages undertaken subsequent to the inception of the policy. A clear expression of this doctrine occurs in The Rubaiyat, 1926, A. M. C. 181, in which the vessel was clearly unseaworthy due to improper loading.

In Cargo Policies

It was originally held that in all cargo policies the

assured warranted the vessel to be seaworthy. Under modern conditions this is manifestly inequitable and is abrogated by a stipulation in cargo policies that the seaworthiness of the vessel is admitted between assured and insurer. The cargo owner does not warrant his cargo to be seaworthy in the sense that it is fit to withstand the voyage. In place of such warranty, the underwriter's exemption for damage due to inherent vice is sufficient.

While the seaworthiness of the vessel is admitted by the policy as between the cargo owner and his underwriter, it is by no means admitted between the shipowner and the cargo interests. Thus a cargo insurer may pay a loss for damage to cargo on an unseaworthy vessel, and then proceed, under the theory of subrogation, to recover from the shipowner. The shipowner's "warranty of seaworthiness" in his bill of lading is then operative, despite its slight modification by the Harter Act.

There is no warranty of seaworthiness in a Protection and Indemnity policy. This was decided in The C. S. Holmes, 1926 A. M. C. 126, the court holding that liability due to unseaworthiness was one of the very risks for which the policy was intended to cover the shipowner. Other cases went so far as to hold that this principle applied even if the unseaworthiness was within the privity of the owner. To escape this unjust result, P. & I. policies now universally bear a clause expressly excepting such losses which arise with the privity or through the fault of the assured.

From this brief discussion, it becomes apparent that in any question involving unseaworthiness, it must first be inquired if the problem arises under a policy or a bill of lading. If it arises under a policy, it must then be ascertained just what type of policy is involved.

Suduffco Held Seaworthy

PACIFIC COAST underwriters will have little difficulty in remembering the ill-fated Suduffco, which disappeared with all on board during a voyage from New York to San Francisco in the spring of 1926. No trace of the vessel was ever found.

Following the disaster, suit was filed against the vessel owners by various interests, chiefly for death claims on behalf of families of the crew. The owners of course petitioned to limit liability, and the District Court in New York has recently held them entitled to limitation (Suduffco, 1929 A. M. C. 773).

The opinion of Thacher, D. J., reads as follows:

"Upon the proofs presented at the trial the petitioners clearly showed seaworthiness at the commencement of the voyage, and accordingly, that they were prima facie entitled to limit their liability to the value of the vessel, and her pending freights. Claimants' witnesses who testified in court impressed me as unreliable and upon the whole case I have no hesitation in finding that the vessel was in fact seaworthy. But if it had been shown that the vessel was in some respects unseaworthy, and that the fact was ascertainable in the exercise of reasonable diligence, the petitioners' only liability would have been for damage resulting from such unseaworthiness. Malcolm Baxter Jr., 277 U. S. 323, 1928 A. M. C. 960. The causal connection between wrong and damage upon which it is necessary to predicate liability might perhaps be shown by proof that defects in hull, machinery or equipment were so serious as to fairly support the inference that they were the cause of her loss. But there is nothing of that kind even in the testimony of the claimants' witnesses. No defect has been shown which in the absence of proof as to how the ship was lost may be presumed to have been the cause of the disaster.

"The burden of proof was upon the claimants to establish liability, and upon the petitioners to show that they were without privity or knowledge of the facts upon which liability is predicated. John H. Starin, 191 Fed. 800 (2 CCA); 84-H, 1924 A. M. C. 774, 296 Fed. 427, (2 CCA); Linseed King, 1928 A. M. C. 589, 24 F. (2d) 967, 970, (SDNY). The facts established exclude the possibility of petitioners' privity or knowledge of the manner in which the vessel was navigated or the circumstances under which she was lost. The claimants' proofs fail to disclose how the loss occurred. It is quite impossible, therefore, to find that the vessel sank because of any defect in hull or equipment; from which it follows that petitioners' right to limit is established, and claimants have failed to prove any facts upon which even limited liability may be predicated.

"A decree in usual form for limitation and exoneration of liability may accordingly be entered."

That Five Hundred Foot Limit

THE rule requiring vessels running parallel to the pierheads in San Francisco Bay to keep more than 500 feet away from the Pierhead Line, is fast becoming similar to the Volstead Act in that it is honored in the breach rather than the observance.

The legal sanction of the rule is found in the harbor regulations prescribed by the Board of State Harbor Commissioners. Extracts from these regulations appear at page 94 in the U. S. Coast Pilot For The Pacific

Coast. The rule in question reads as follows:

"(1) Vessels propelled by steam must not run inside of a line 500 feet distant from and parallel to a line drawn through the outer ends of the piers."

Since the piers differ greatly in length, it would be interesting to chart the course of a vessel endeavoring to parallel a line running through their outer extremities. In this respect the rule resembles the old "headland to headland" rule, by which federal authorities have staked claims on large bodies of water from time to time. It is also interesting to note that the term, "vessels propelled by steam" is defined in another part of the rules as including all vessels propelled by mechanical motive power.

While the regulation of the Board of State Harbor Commissioners lacks the punitive force of a federal law, ship owners and navigators have become increasingly careless in their respect for its provisions. Recent cases, however, have indicated that the federal courts, in collision cases, are extremely active in considering the breach of the 500-foot rule as a definite error in navigation.

The point recently came up in connection with a hearing before a naval board of inquiry considering a collision between the U. S. S. Unadilla and the barge Colorado off Pier 16. In that case the Colorado, in tow of the tug Wm. Fisher, was able to adduce a preponderance of evidence to show that she was at least 600 feet off the pierhead line, thus escaping a share of blame for the collision.

In the case of Pacific Motorship Company v. Coos Bay Lumber Company, decided by Federal Judge A. F. St. Sure on June 17 of this year, the motorship Boobyalla was not so fortunate. In this case the collision resulted after the tug Dixie, with a barge in tow, had left her pier to proceed out into the bay. At about the same time the Boobyalla backed away from her berth and attempted to turn and come on her course within 500 feet of the pierhead line. The court held that the collision resulted from this maneuver, and that the Boobyalla was entirely to blame. Prior to this decision it had been generally assumed that the 500-foot limit applied only to vessels pursuing a continuous course for some distance parallel to the waterfront. The court's ruling, however, brings backing and turning maneuvers within the requirements of the rule. No opinion is filed in the case, but the final decree reads in part as follows:

"That the tug Dixie and her commander were entitled to rely on the backing away of the twin-screw motorship out into the harbor of San Francisco and more than 500 feet beyond the said Pierhead line, and on her not maneuvering towards said Pierheads within said 500 feet, and the said Dixie and her tow were entitled to make their course away from the said piers on the hypothesis and belief that the said twin-screw motorship Boobyalla would continue to so back into the bay, and not maneuver forward toward said Pierheads within said 500-foot line."

Messrs. McCutchen, Olney, Mannon and Greene appeared for the Boobyalla and her owners, while William Denman represented the Dixie in the litigation.

Mixed Cargo

And Al Hillback says to me, he says, "The trouble with you marine insurance people is that you aren't stabilized like we are in the casualty business. You haven't any organization nor constant factors to affect your rates."

But then, Al never heard of Supply and Demand, Inc. —nor the fishboat pool, nor the Intercoastal Agreement.

Now that the New York Court of Appeals has upheld the authority of a ship master to perform marriages (1929 A. M. C. 659), all that is needed to encourage sea travel is to give the master the power to grant divorces.

"What ho, Purser. A double stateroom as far as the three-mile limit."

I walked into the office of T. N. Alexander last week, and found the usually suave and urbane chief of the Dollar Line claim department all hot under the collar.

"Look at that," he snorted, waving a fistful of papers at me. And when I looked at the papers, I didn't blame him.

It seems that a large and prosperous exporting firm had shipped some canned peaches from here to there on one of the President boats. Upon arrival, one can of peaches out of a certain case had failed to answer roll call.

The papers formed a claim in triplicate, with supporting documents, for fifteen cents.

And then there is the classic remark of the judge who was hearing a collision case.

After listening to the testimony of the navigators of the two vessels in respect to their positions, he said, "I am forced to the conclusion that there was no collision,

since the vessels were a mile and a half apart when the collision occurred."

We are in receipt of a card from our good friend, S. E. Pamphilon, well-known independent cargo surveyor and appraiser of San Francisco, announcing his removal to new offices in the Merchants Exchange Building, at 465 California Street.

George Hauerken, who has made a host of friends on California Street during his term of office as chief of the marine loss department for the Pacific Coast agency of the Home of New York and the Franklin Fire, has left the marine insurance field and opened offices for the general practice of law in the Foxcroft Building, San Francisco.

Mr. Hauerken, prior to his connection with the Home and Franklin, was a member of the marine department of the home office of the Fireman's Fund Insurance Company. Practical experience gained with these companies should be of inestimable value in his new field of endeavor.

The destinies of the marine loss department of the Home and Franklin, now in new offices in the Insurance Exchange Building, will hereafter be guided by Harry Stoddard, formerly head of the loss department of the Automobile Insurance Company. San Francisco marine men owe a good deal to this chap Stoddard. It was the blond whirlwind of California Street, if memory serves us right, who conceived and engineered the Marine Insurance Study Class, now in its eighth year and still going strong.

ENGLISH COURT HOLDS SLIP SUPERSEDES POLICY

THE English Court of Appeal has recently decided an interesting case having some bearing on the warehouse to warehouse clause and containing an interesting discussion of the relation of a "slip" or cover-note as used in England to a policy later issued on the same risk. (Symington & Company v. Union Insurance Society of Canton, XXXIV Com. Cas. 233.)

Symington & Company were shippers of cork, having a factory and warehouse at Algeciras. They were accustomed to allow the output of this factory to accumulate on the jetty until there was enough for a cargo. While an accumulation was on the jetty, they effected an insurance by means of a slip. Before a policy was actually issued, a fire occurred on the jetty, which consumed some of the cork and resulted in the local authorities throwing water on the remainder to extinguish the blaze.

The policy which was later issued contained the Institute Cargo Clauses, including the Warehouse to Warehouse Clause and the F. C. & S. Clause, and also included a marginal clause providing that shore risk against fire was not covered where the assured had fire insurance.

It was held that the insurer was liable on the slip, and had no right to the protection of clauses which appeared only in the policy.

"The obligation of the underwriter," says the court, "originated in the slip, and their duty, in honour if not in law, was to reproduce the terms of the slip in the policy. If an insurance company wishes to make their obligation as expressed in the policy differ from the obligation which they have undertaken in the slip they must reserve in the slip power to make such alteration. Without such power, where there is a total contradiction between the terms of the slip and those of the policy, the terms of the slip must prevail. In this case there is at least a partial contradiction between the slip and the policy in material respects; for instance, the clause included in the slip covers liability for stranding anywhere, but the policy excludes liability for stranding in the Suez Canal. If underwriters wish to alter the terms of the slip they must say so in express terms. Here the effect of the marginal clause is partially to limit or contradict the effect of clause 9 of the policy; and if the underwriters had wished to limit or contradict that clause, which it was agreed should appear in the policy, they should have said so in the slip. What they are trying to do here is to limit clause 9, which provides that they will pay 'any loss' by saying that they will only pay if the insured is not insured elsewhere. They cannot do this, and the defence must therefore fail."

A THOUSAND PASSENGERS IN DRY-DOCK FIVE DAYS

CONTRACT for repair of the steamship River Orontes, of the American Levant Line, which was badly damaged in a collision in New York Harbor off quarantine with the steamship Cristobal Colon, was awarded to United Dry Docks, Inc., which agreed to do the work in 22 days. The accepted bid was $36,000.

Award of the contract to United Dry Docks thus brought to the Morse Plant of that company both vessels that figured in the collision. Earlier in the month the Cristobal Colon was repaired, a feature of the task being the maintenance of accommodations for approximately 1000 passengers who remained aboard the ship during its five days in dry dock.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Shipbuilding Work in Prospect

Car Ferry for Lake Michigan Proposed.

The Interstate Commerce Commission has approved a recommendation that the Grand Trunk Milwaukee Car Ferry Co. or the Grand Trunk Western Railroad operate car ferry service across Lake Michigan between Muskegon and Milwaukee.

Alaska Line to Recondition Mexico.

The Alaska Steamship Company of Seattle has purchased the steamer Mexico from the Ward Line of New York for its Seattle-Alaska passenger and freight service. The vessel is to be brought to the West Seattle plant of the steamship company for almost complete rebuilding.

According to the reports of the work contemplated to fit this vessel for her new service is the installation of high pressure boilers in order to increase her speed; building passenger accommodations for 300 in first class; and equipping the vessel with all up-to-date equipment and furnishings.

The Mexico is 416 feet long, 50 feet beam, and 30 feet depth. She has twin screws and is of 6207 gross tons.

New Cable Ship for Dominion

The Dominion Parliament, meeting in its recent session at Ottawa, approved a supplementary estimate providing, under the Department of Public Works, for $100,000 for a cable ship for the lower St. Lawrence and Maritime Provinces.

Fireboat for New York

The Department of Plant and Structure of New York will build a new fireboat which will be 130 feet long, 26 feet beam, 7 feet 6 inches draft and will have 548-horsepower engines developing a total of 2740 horsepower connected to electric generator for pumping purposes. The propulsion motors will be of 1165 horsepower each.

New York Firm to Build Auto Ferryboats

The Waterways Transport Co., Inc., of New York, has received bids for the construction of two 265-foot automobile ferryboats to be operated in canal service. Eads Johnson, 115 Broadway, New York, is the naval architect. Bids were asked on directly diesel and diesel-electric drive.

New York City Ferryboat To Be Ordered Soon

The Department of Plant and Structure of the City of New York, R. W. Morrell, naval architect, is preparing plans for the construction of a new steel ferryboat to be similar to the Dongan Hills illustrated on this page and bids will be asked shortly.

Liner Contracts Await Mail Subvention Contracts

Contract awards for the construction of two de luxe liners for the Dollar Steamship Company of San Francisco for its transpacific service are still unsigned, although it is practically assured that Newport News Shipbuilding & Drydock Company has been given the contract for the first two of a fleet of six new vessels. The final approval of the plans of the vessel and mail subsidies must be made by the three agencies of the government, The Shipping Board, the Post Office Department, and the Navy Department. It is hoped that all details of the construction program will soon be straightened out so that work can go ahead on these two 600-foot liners.

The Matson Navigation Company's plans for the award of a contract to Bethlehem Shipbuilding Corporation for two fine new vessels for its San Francisco-Australia service have not yet been approved by the government agencies to provide for their construction under the Merchant Marine Act, 1928. Approval is looked for very shortly.

Dominion Government to Ask Bids On Ferry

It is reported from Ottawa, Department of Naval Constructor, Marine Department, that plans are now ready and bids will be called shortly by the Railways and Canal Department, for a 310-foot ferryboat for operating between Tormentine, New Brunswick, and Borden, Prince Edward Island, estimated cost being $2,000,000.

The Dominion Government is also considering the construction of a hydrographic survey vessel to cost $400,000.

Fireboat for Oakland Asked

C. C. Young, Commissioner of Public Health and Safety, Oakland, California, has sponsored a resolution before the City Council requesting the Board of Port Commissioners to purchase a fireboat for the protection of the Oakland waterfront in conformity with provisions of the harbor bond issue approved in 1925 for $10,000,000, under which extensive improvements have been, and are being, made in the Oakland harbor facilities.

New Construction Under Consideration on the Atlantic Coast

Plans for the construction of two great liners for the United States Lines as running mates for the Leviathan are nearing completion, and it is reported that they will be submitted to the Shipping Board and other governmental agencies this fall. The vessels will be smaller than the Leviathan, but will have more speed and will accommodate about 2500 passengers in addition to space for mail and express cargoes.

The United Fruit Company of Boston is reported to be planning to construct four passenger and

freight steamers for the Boston-New York-South America trade, depending upon the receipt of a mail subvention contract.

The New York and Porto Rico Steamship Company, 25 Broadway, New York, is about to order construction of a passenger and freight vessel similar to the steamer Coamo, built in 1925, to be 429 feet long, 59.5 feet beam, 35 feet depth, equipped to carry passengers, general cargo, and refrigerated cargo in the tropics.

Westinghouse Electric & Manufacturing Company has announced that it has received contract for supplying the electrical propulsion machinery to three new tankers, two for the Sun Oil Company and one for the Tidewater Oil Company.

News from the Shipyards

Ballard Marine Railway Company, Seattle, Washington, has been awarded contract for construction of a patrol cruiser for the United States Bureau of Fisheries, Seattle, Washington, on a low bid of $89,589.

The boat will be 130 feet long, 27 feet beam, 17 feet 10 inches depth; built of Alaska yellow cedar and Douglas fir; powered by a 400-horsepower, 6-cylinder Union diesel engine. Designed by H. C. Hanson, Seattle.

Naval Department Awards Contracts for Cruisers

The Secretary of the Navy, Charles F. Adams, has announced awards of contracts for the construction of five 10.000-ton cruisers as follows:

Bethlehem Shipbuilding Corporation, Fore River Plant, Quincy, Massachusetts, has been awarded contract for the construction of Light Cruiser No. 33 for the United States Navy, on a bid of $10,753,000 and time of 36 months.

Puget Sound Navy Yard, Bremerton, Washington, has been awarded contract for the construction of Light Cruiser No. 32, having submitted a low estimate of $8,838,000 and time of 40 months.

New York Shipbuilding Company, Camden, New Jersey, will build Cruiser No. 35, on a bid of $10,903,200 for delivery in 36 months.

Philadelphia Navy Yard will build one cruiser, having submitted estimate of $10,285,906.

New York Navy Yard will build one cruiser, estimate submitted having been $10,508,100.

Moore Dry Dock Company, Oakland, California, has been awarded contract by the Santa Fe Railroad Company of San Francisco for an all steel carfloat to be 280 feet long, 40 feet beam, 11 feet depth, with capacity of 18 freight cars.

Above is a photograph of the launching of the steamship Humuula and (insert) Mrs. George K. Nichols, sponsor. The Humuula is the third vessel building in the last year by the Union Plant, Bethlehem Shipbuilding Corporation for the Inter-Island Steam Navigation Company. She will shortly enter service in the freight carrying business between the Islands.

New York Shipbuilding Company, Camden, New Jersey, has an order for a carfloat for the Erie Railroad, 366 by 38 by 10 feet 5 inches; also order for cement barge for International Cement Corp., 156 by 37 feet 4 inches by 13 feet.

American Bridge Company has an order from the Rodgers Sand Company for six sand and gravel barges, 135 by 27 by 7 feet 6 inches.

Manitowoc Shipbuilding Corp., Manitowoc, Wisconsin, has an order for four Ellis channel barges.

Federal Shipbuilding & Drydock Company, Kearny, New Jersey, has an order for an 80 foot barge for the Venezuela Gulf Oil Company.

Midland Barge Company, Midland, Pennsylvania, has an order for 5 steel barges for New York State Canal Commission, 75 by 25 by 5 feet 6 inches; one barge for M. H. Treadwell Company, 106 by 30 by 7 feet.

Spedden Shipbuilding Company, Baltimore, Maryland, has an order from the United States Department of Health, Boston, for a steel hull freight and passenger tug, 90 L. O. A.; 20 molded beam; 9-foot draft; to be powered by 350 horsepower Standard diesel engine.

Prince Rupert Drydock & Shipyard, Prince Rupert, British Columbia, has an order for four 110-foot wooden scows.

This yard has also started work of entirely dismantling to bare hull and machinery the twin screw steamer Aktion, recently purchased by the Canadian National Steamships. New accommodations will be built into the vessel and she will be completely refitted for the service between Prince Rupert and Queen Charlotte Islands. The vessel will be ready for service next spring. She is 177 feet long, 23 feet beam, 8 feet draft; has triple expansion engines; and steam is supplied by two Thornycroft type water-tube boilers.

The Panama Canal will construct a tender for the new diesel-electric dredge Las Cruces in the shops of the Mechanical Division at the Canal. The tender will be 60 feet long, 16 feet beam, 8 feet molded depth, 5 feet 6 inches draft. Power will be supplied by a 4-cylinder,

120-horsepower diesel engine, arranged for pilot house control. A generator directly connected to the engine will supply electric light.

REPAIRS

St. Helens Shipbuilding Company, St. Helens, Oregon, has been awarded contract for repairs to the steam schooner Multnomah, which was damaged in a storm off the Columbia River recently, on a low bid of $4602.

Los Angeles Shipbuilding & Drydock Company, San Pedro, California, has been awarded contract, on a bid of $20,750, for repairs to the Dimon Line freighter Pacific Oak. The liner collided with the Standard Oil tanker District of Columbia in a fog off Point Arguello.

Bethlehem Shipbuilding Corp., San Francisco, was awarded repair contract on the District of Columbia on a low bid of $19,900 and 13 days.

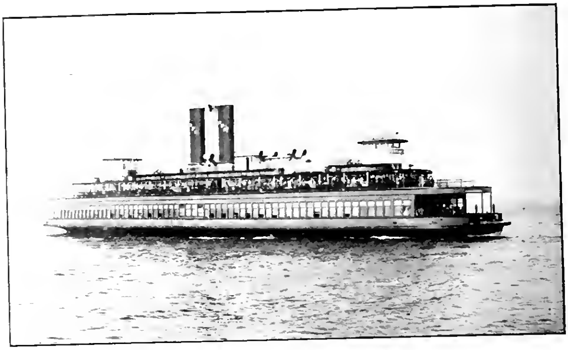
General Engineering & Drydock Company, Oakland, will perform annual overhaul and drydocking to the lighthouse tender Sequoia on a low bid of $5273. Other bids submitted were: Bethlehem, $5703; Moore Dry Dock Company, $5970.

Omar Van Hee of Seattle has purchased the wreck of the Transmarine Line freighter Sujameco from the Pacific Salvage Company. The Sujameco grounded on a sandy beach at Coos Bay March 1.

Newport News Shipbuilding & Drydock Company has been awarded contract by the Dollar Steamship Company of San Francisco for reconditioning the passenger accommodations of the steamer Mongolia, purchased from the Panama Pacific Line. The Mongolia will be put into condition for first class passenger service in the round-the-world service and will be similar to the President Johnson (ex-Manchuria) which went into service this spring. Cost of work will be about $500,000.

Moore Dry Dock Co., Oakland, Calif., was low bidder on general overhaul and alterations to the U. S. Coast Guard cutter Cahokia. Bids submitted for this work were: Moore Dry Dock Co., $20,620; Bethlehem Shipbuilding Corp., $23,423; General Engineering & Drydock Co., $23,955.

Alexander & Baldwin, Ltd., Seattle manager for Matson Navigation Co. has called for bids for repairs to the steamer Mauna Ala, which had her superstructure badly damaged by fire while alongside the Union Pacific dock when the latter was completely destroyed. Estimated cost of the ship repair is $25,000.



Fine New York ferryboat Dongan Hills, just completed by the Staten Island Plant of United Dry Docks, Inc., for the City of New York. A short description of the boat appears on this page.

General Engineering & Drydock Co., Oakland, Calif., was low bidder for collision damage repairs to the steamer Santa Inez of the Grace Line. Cost of repairs is $28,950 and 18 days time. The Santa Inez collided with the tanker Lio off Cape Flattery early in July.

SHIPYARD NEWS

The new steel passenger and freight motorship W. B. Foshay was launched by the Lake Washington Shipyards at Seattle on July 27. This fine new vessel was built for the Northland Transportation Company, a subsidiary of the W. B. Foshay interests of Minneapolis. She will operate between Seattle and Ketchikan and will cater to commercial rather than tourist travel.

The W. B. Foshay is of all steel construction, 168 feet long, and will have capacity for a large amount of freight as well as accommodations for 60 passengers in 26 large staterooms. Her power plant will consist of two 550-horsepower, 8-cylinder Washington-Estep diesel engines, which will give her a speed of about 12 knots.

An announcement has been received from Daniel H. Cox of the firm of Cox & Stevens, Inc., and from William Francis Gibbs and Frederick H. Gibbs of Gibbs Bros., Inc., prominent New York Naval architects, that they have joined forces and will now be known as Gibbs & Cox, Inc. Offices will be at 1 Broadway, New York.

New York Ferry Dongan Hills

The Dongan Hills, largest and fastest unit of New York City's water transport system, was placed in service in June between St. George, Staten Island, and South Ferry, Manhattan.

Built at the Staten Island Plant of United Dry Docks Inc., the Dongan Hills was launched on March 19 and was given her trials early in June. This ferry made 18 miles an hour on her trials, developing 4000-horsepower. She is 265 feet long over-all, 66 feet wide over guards, 19 feet, 9 inches deep and of 12 feet 6 inches draft. She provides seats for 1650 passengers on two decks, and space for 32 vehicles.

Designed by Robert W. Morrell, naval architect for New York City, the Dongan Hills represents the most modern steel construction, provides maximum comfort and protection for passengers.

Her main propulsion plant comprises one double compound condensing engine, $22\frac{1}{2}$ x 50 inches diameter of cylinders, with 30 inch stroke driving one through shaft fitted with a screw propeller at each end of the hull. Steam is generated in 4 water-tube, oil-burning boilers, each of 3577 square feet heating surface.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of July 1, 1929.

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length over-all; 30' beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28; launched 6/17/29.

Hull No. 113, lightship, sister to above; keel Sept. 1/28; launch July 10/29 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BALLARD MARINE RAILWAY COMPANY
Seattle, Washington.

Penquin, hull J-97, patrol boat for U. S. Bureau of Fisheries, Seattle; 130 L.B.P.; 27 beam; Union diesel eng.; deliver January/30.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT
Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Humuula, hull 5338, steel passenger and freight steamer for Inter-Island Steam Navigation Company, Honolulu, 218'3" L.O.A.; 38' breadth; 17' depth; Westinghouse turbines; 1100 gr. tons; keel April 1/29; **launched June 15/29.**

Not named, hull 5342, steel tow barge for Shell Co., Los Angeles; 131 L.O.A.; 40 beam; 9'6" draft; 1000 gr. tons; **keel 6/-12/29.**

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A. Wanner.

Unnamed, No. 21, diesel-electric cutter for U.S. Coast Guard; 250x42x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.; keel laid; launch 11/1/29 est.

Unnamed, No. 22, same as above; keel laid.

Unnamed, No. 23, same as above.

J. C. JOHNSON'S SHIPYARD
Port Blakley, Wash.

Four fish scows for Northwestern Fisheries Co., Seattle; 60x18x5'6".

One 60ft. service boat for Washington Pulp & Paper Co., Seattle.

LAKE WASHINGTON SHIPYARDS,
Houghton, Wn.

Purchasing Agent: A. R. Van Sant.

Foshay, hull 107, steel passenger and freight motorship for Northland Transportation Co., Seattle; 186x35 ft. beam; two 550-H.P. Washington-Estep diesel engs.; keel Mar. 4/29; launch July 27/29 est.

THE MOORE DRY DOCK CO.
Oakland, Calif.

Hull 179, steel carfloat for Atchison, Topeka & Santa Fe Ry. Co.; 260 L.B.P.; 38 beam; 7'6" draft; 1000 D.W.T.; keel 10/2/29 est.; launch 12/20/29 est.; deliver 1/11/30 est.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

Purchasing Agent: C. C. Labric.

Chief Seegay, hull 28, fish packer for Canadian Fish & Cold Storage Co., Prince Rupert, B.C.; 67 L.O.A.; 16'6" beam; 8'8" depth; 50 D.W.T.; 60 B.H.P. Fairbanks-Morse C.O. eng.; keel Mar. 15/29; launched June 6/29.

Ispaco I, hull 29, pilchard seine boat for Island Packing Co., Victoria, B.C.; 65 L.O.A.; 17'5" beam; 7'8" depth; 75-H.P. Atlas-Imperial diesel eng.; keel Mar. 15/29; **launched June 7/29.**

Ispaco II, hull 30, sister to above; keel Mar. 15/29; **launched June 7/29.**

Unnamed, hull 31, steel tug for Canadian National Railways; 90x20x9 (approx. dim.); 360 I.H.P. steam eng., 1 10ft. Scotch boiler.

Hull 32, steel car barge for Canadian National Railways, 184 x 40 x abt. 5 ft.; cap. 8 loaded cars.

Hulls 31 and 32 to be fabricated at yard; then shipped to Kelorona on Okanogan Lake for completion.

Hulls 33 to 36, inc., four wooden scows, 110 x 38 x 9'8", keels 8/15/29 est.; deliver 10/15/29 est.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Six barges for Erector Dept.; 175 x 26 x 11 ft.; **5 delivered.**

Twenty-four cargo barges for Inland Waterways Corp.; 230x45x11 ft.

Six sand and gravel barges for Rodgers Sand Co., 135 x 27 x 7'6".

AMERICAN SHIP BUILDING CO.,
Lorain, Ohio

Purchasing Agent: C. H. Hirsching.

Not named, hull 804, bulk cargo vessel for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft. 12½ mi. speed; T.E. eng 2200 I.H.P.; 3 Scotch boilers, 14 x 12 ft.; keel Mar. 25/29; launch June 8/29 est.; deliver July 29/29 est.

Not named, hull 805, sister to above; keel Apr. 8/29; launch May 18/29 est.; deliver June 22/29 est.

BATH IRON WORKS
Bath, Maine

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer; keel Dec. 3/28; launch Apr. 10/29 est.; deliver May 1/29 est.

Hi-Es-Maro, hull 123, twin screw steel diesel yacht, Henry J. Gielow, Inc., New York, designer; 266'x35'x22' depth; 14'6" draft; two 1200 B.H.P. Bessemer diesel engs.; keel Nov. 14/28; **launched 6/7/29;** deliver July 15/29 est.

Corsair, hull 124, twin screw steel steam turbo-electric yacht; 343x42x27ft., 18 ft. draft; 6000 S H.P.; General Electric turbo-generators; Babcock & Wilcox boilers; **keel June 11/29.**

Ebb, hull 126, fishing trawler for Bay State Fishing Co., Boston, Mass., Bath Iron Works design; 132'4" L.O.A.; 121'6" L.W.L.; 24 beam; 13 depth; 500-600 B.H.P. Winton diesel engs.; **keel 6/18/29.**

Flow, hull 127, sister to above; **keel 6/18/29.**

Malaina, hull 128, steel yacht; B. T. Dobson, designer; owner not named; 168 L.B.P.; 26 beam; 9 draft; twin Winton diesel engs.; 1600 I H.P.; keel Dec. 5/29 est.

Notre Dame, hull 129, trawler for A. & P. Fish Co., Boston; 116 I.H.P.; 23 beam; 11 loaded draft; single screw; 500 I.H.P. Bessemer diesel eng.; **keel 6/18/29.**

Fordham, hull 130, trawler; sister to above; **keel 6/18/29.**

Unnamed, hull 131, steel aux. schr. yacht; Henry J. Gielow, designer; owner not named; 150 L.B.P.; 32 beam; single screw; 300 I.H.P. Bessemer diesel eng.; keel 10/1/29 est.

Not named, hull 132, twin screw diesel yacht for Henry J. Gielow, designer; 105 L.O.A.; 2 200-H.P. Bessemer diesels.

Not named, hull 133, twin screw diesel yacht; B. T. Dobson, designer; 125 L.O.A.; 2 400-H.P. Winton diesels.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Berwindvale, Hull 1422, single-screw coal collier for Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers; launched June 8/29.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Hull 1425, steel coasting vessel for Seaboard Shipping Co.; 450 gr. tons.

Hull 1426, steel barge for Gulf Refining Co.

Hulls 4252-54, three steel barges for Atlantic Transport Co. 700 Gr. T. ea.

Hulls 6139-40, two steel barges for Western Maryland Ry. Co. 499 Gr. T. ea.

BETHLEHEM SHIPBUILDING CORP., LTD.,
Baltimore, Md.

Hull 4240, steel 3-track carfloat for Western Maryland Railway; 325 x 38'6" x 10'8"; **launched May 1/29.**

Hull 4241, same as above.

Hull 4242, same as above.

Hull 4243, steel barge for Western Maryland Rly. Co

Hulls 4244-4251, 8 scows for Arundel Corp.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; Winton engs.; General Electric generators and motors; keel Jan. 30/29; launch July 1/29 est.

No. 116, same as above; keel Feb. 6/29; launch Sept. 1/29 est.

No. 117, same as above; keel May 1/29; launch Dec. 1/29 est.

One all-welded tanker for stock.

One all-welded tanker.

COLLINGWOOD SHIPYARDS, Ltd.
Collingwood, Ontario.

Purchasing Agent. E. Podmore.

No name, hull 83, tug for Toronto Harbor Comm.; 100 x 25 x 10'6"; 11 loaded speed; T.E. engs. 1000 I.H.P.; Scotch boilers, 150 lbs. press.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Solana, hull 2930, 106-foot cruiser for W. C. Robinson, Pittsburgh; 2 Speed-

way diesel engs.: **delivered May 15/29.**

Alida, hull 2936, 75ft. commuter boat for B. H. Borden; 2 300-H.P. Speedway engs.; **delivered June 1/29.**

Redwing, hull 3937, 66ft. day cruiser for G. B. Huppin: 2 170-H.P. Speedway engs.: **delivered July 1/29.**

Dolphin, hull 2938, 66ft. day cruiser for H. Murray; 2 170 H.P. Speedway engs.; deliver Aug. 1/29 est.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Yoreda, hull 131, steel yacht, for Aaron De Roy, Detroit; 105 L.B.P.; 17 beam; 6 loaded draft; 14 mil. loaded speed; 110 D.W.T.; 250 H.P. diesel eng.: keel Aug. 1/28; launched 5/15/29; **delivered 6/1/29.**

Olive K., hull 133, steel yacht for C. F. Kettering, Detroit; 169 L.B.P.; 26 beam; 12 loaded draft; 15 knots speed; 600 D.W.T.; 1000 I.H.P. diesel engs.; keel Jan. 15/29; launch July 1/29 est.; deliver Aug. 15/29 est.

Robark, hull 135, wood yacht for K. T. Keller, Detroit; 83 L.B.P.; 15'6" beam; 4'6" loaded draft; 14 M.P.H. speed; 82 D.W.T.; 300 H.P. Winton diesel engs.; keel Feb. 15/29; launched June 1/29; **delivery July 1/29.**

Not named, hull 136, steel yacht for A. V. Davis, New York; 138'6" L.B.P.; 18 beam, 5 loaded draft; 20 M.P.H.; 150 D.W.T.; 1400 I.H.P. diesel engs.; keel July 15/29 est.; launch Oct. 1/29 est.; deliver Apr. 15/30 est.

Marnell, hull 137, steel yacht for M. H. Alworth, Duluth; 135 L.B.P.; 22 beam; 6'9" draft; 14 M.P.H.; 175 D.W.T.; 600 I.H.P. diesel engs.; keel Apr. 15/29; launch Sept. 1/29 est.; deliver Nov. 1/29 est.

DRAVO CONTRACTING COMPANY,
Pittsburg, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'6" x 26'6" x 5' 6".

Hulls 811-815 inc.; five steel dump scows for American Dredging Co., Philadelphia; 112 x 34 x 12 ft.; two delivered.

Hull 816, steel oil barge for American Dredging Co., Philadelphia; 100 x 34 x 10'3".

Hull 817, one welded steel barge for stock; 100 x 26 x 6'6".

Hulls 821 to 825 inc.; 5 deck scows for New York Central R.R.; 100'x33'8"x9'7".

Hulls 826 to 829 incl.; 4 1500-cu. yd. dump scows for Geo. H. Breymann & Bros., New York.

Hull 832, steel oil barge for Atlantic, Gulf & Pac. Co., 100x30x 9 ft.

Hull 833, steel floating dry dock for Warner Co., Philadelphia.

Hulls 834-837 inc., 4 merchandise barges for Commercial Transp. Co., Monroe, La.; 130 x 30 x 7'6".

Hulls 838-843 inc., 6 standard sand and gravel barges for stock.

Hulls 844-855 incl., 12 standard sand and gravel barges for stock; 100x26x6'6".

Hulls 858 to 876 incl., 19 standard M.R.C. type steel barges for U.S. Engineers' Office, Memphis; **16 delivered.**

Hulls 883-892 incl., 10 steel sand and gravel barges for Arundal Corp., Baltimore; 130 x 34 x 8'9".

Hulls 894 to 898, incl., 5 steel hopper type coal barges for Island Creek Coal Co., Huntington, W. Va.

Hulls 898-905 incl., 8 sand and gravel barges for Keystone Sand & Gravel Co.; 135x27x8'.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 109, dredge hull for Gahagan Const. Co., 160 x 40 x 13'6"; keel Mar. 13/29; launched June 1/29.

Hull 111, steel welded barge for O'Brien Bros.; 120 x 36 ft.; 1200 D.W.T.

Hull 112, barge for Venezuela Gulf Oil Co.: 80 x 24 x 6 ft.

GREAT LAKES ENGINEERING WORKS,
River Rouge, Michigan

Myron C. Taylor, hull 269, bulk freighter for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12 mi. speed; 12,000 gr. tons; TE engs. 2250 I.H.P. 2 W.T. boilers; keel Mar. 14/29, launch July 15/29 est.; delivery Aug. 1/29 est.

Hull 271, steel dump scow for Dumbar & Sullivan Dredg. Co.: 168 x 40 ft.; keel 5/29/29; deliver 7/1/29 est.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1660, lighthouse tender for U.S. Bureau of Lighthouses; 100x30x5'; keel Mar. 11/29; launched 5/10/29; **delivered July 5/29.**

Hull 1677, track barge for Yourtel-Roberts Sand Co., Chester, Ill.; 195x30x6'6"; keel July 15/29 est.

Hulls 1673-1676, four combination cargo and oil barges for American Barge Line Co., Louisville, Ky; 150x35x11'; **one keel 5/10/29; keel 6/5/29.**

Houghland, hull 1672, steel hull for towboat for Walter G. Hougland, Bowling Green, Ky. 86x22'x42"; keel 4/10/29; **launched 6/5/29.**

Hulls 1667-1671, five steel motorboats for U.S. Engineers, Vicksburg, Miss.; 30 x 7'6"x2'6"; keels May 23, 29, 31/29; **June 3, 4 29.**

Hull 1661, steel hull, steam towboat, for stock; 148x30x5 ft.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

City of Saginaw, hull 246, car ferry for Pere Marquette Rail; Co.; 368 L.B.P. 57 beam; 17 loaded draft; 18 m. speed; 2 turbines; 3600 I.H.P. each; 4 Babcock & Wilcox W.T. boilers; keel Mar. 4/29; launch July /29 est.

City of Flint, hull 247, car ferry, sister to above; keel May 1/29.

Reality, hull 248, steel yacht, owner not named; 78 long; 15 beam; 8'9" depth; 6' draft; 150 H.P. Fairbanks - Morse eng.; **keel June 12/29.**

Hulls 249-252, four Ellis channel barges.

MIDLAND BARGE COMPANY
Midland, Pa.

Five steel cargo barges for Inland Waterways Corp.; 230x45x11 ft.; 3 keels laid.

One steel hull for New York State Canal Comm.; 106x30x7 ft.

Five steel barges for N.Y. State Canal Comm.; 75 x 25 x 5'6".

One barge for M. H. Treadwell Co., New York; 106 x 30 x 7 ft.

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Stadacona, hull 24, bulk freighter for Canada Steamship Lines, Ltd., Montreal; 582 L.B.P.; 60 beam; 20 loaded draft; 11 knots speed; 12,000 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 Scotch boilers; 15'3" dia x 11'6" lg.; keel Apr. 17/29; launch Aug. /29 est.; deliver Sept. /29 est.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, R. L. Baldwin.

W. W. Fischer, hull 169, diesel towboat for Central Sand Co.; 120x26x5½ ft.; 720 I.H.P.; Fairbanks-Morse diesel; keel Feb. 15/29; **launched 6/22/29.**

Hulls 188-189, two deck barges for stock; 100x24x5 ft.; keels Mar. 21-28/29; **launched May 20/29.**

Hulls 190-191, two deck barges for stock; 75x20x5 ft.; keels Apr. 3-7/29; **launched May 15/29.**

Hull 192. deck barge for stock; 120 x 30x6 ft.; keel Apr. 2/29; **launch May 25/29.**

Hull 193, deck barge for stock; 110 x 28x7¼ ft.; keel 4/28/29; launched 5/29/29; **delivered 6/1/29.**

Hulls 194-195, 2 deck barges for stock; 100 x 24 x 5 ft.; **keels 5/24 and 30/29.**

Hull 196, drydock, 42 x 36 x 5 ft.; keel July 1/29 est.

Hull 200, towboat, owner not named; 56x14x5'6"; keels July 15/29 est.

Hulls 201-4 inc., four deck barges for stock; 130x32x8 ft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Pennsylvania, hull 329, 18 - knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Oct. 15/28; **launched July 10/29.**

Ward, hull 332, diesel conversion for U.S. Shipping Board; deliver July/29 est.

Not named, hull 337, passenger liner for A.G.W.I. Nav. Co., New York; 508 x 70'9" x 39'; 15,380 tons displ.; 16,000 S.H.P.; 20 knots speed; turbo-elec. drive; keel Aug./29 est.

Not named, hull 338, sister to above; keel July/29 est.

NEW YORK SHIPBUILDING CO.

Camden, N. J.

Purchasing Agent: J. W. Meeker.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; launched Jan. 23/29; deliver July 9/29 est.

Chester, light cruiser CL- 27 for United States Navy. 10.000 tons displacement; keel Mar. 7/28; **launched 7/3/29;** deliver June 13/30 est.

Santa Clara, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'9" beam; 37'5" depth; General Electric turbo-electric machinery; keel Feb. 4/29; launch Sept./29 est.; deliver Apr./30 est.

Hull 390. carfloat for Erie R.R. Co.; 366x38x10'5"; keel 5/29/29; launch July/29 est.; deliver Aug./29 est.

Hull 391, same as above; keel May/29; launch July /29 est.; deliver Aug. /29 est.

Hull 392, same as above; **keel June 29/29.**

Hull 393, same as above.

Hull 298. cement barge for International Cement Corp.; 156'x37'4"x13'; keel 7/22/29 est.; launch 9/16/29 est.; deliver 9/30/29 est.

THE PUSEY & JONES CORP.,

Wilmington, Del.

Purchasing Agent: James Bradford.

Tidewater, hull 1039, oil tanker for Tide Water Oil Co.; 225 L.B.P.; 44 beam; 15'6" loaded draft; 10½ knots speed; 2300 D.W.T.; diesel-electric power; 1000 I.H.P.; keel Jan. 12/29; launched Apr. 23/29; **delivered 7/1/29.**

Nakhoda, hull 1040, yacht for Fred J. Fisher, Detroit; 236 L.O.A.; 34 beam; 19 depth; 12'6" draft; 2 1100 H.P. diesel engs.; keel Feb. 12/29; launch July 20/29 est.

Rene, hull 1041, yacht for Alfred P. Sloan, Jr., New York; same as above; keel Feb. 12/29; launch 7/20/29 est.; deliver Aug. 15/29 est.

Cambriona, hull 1042, yacht for owner not named, same as above; keel Mar. 12/29; launch Aug. 20/29 est.; deliver Sept. 15/29 est.

Lotusland, hull 1043, twin screw diesel yacht. ordered by Cox & Stevens, Inc., New York; 168'9" long, 28' beam; two 500-B.H.P. diesel eng.; **keel June 13/29;** deliver Dec./29 est.

THE SPEAR ENGINEERS, INC.,

Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

John M. Dennis, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450-I.H.P. engs.; keel Feb. 18/28; launched Dec. 15/28. **delivered June 13/29.**

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor, keel Aug. 18/28.

City of Norfolk. hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400

B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P., keel Feb. 1/29; launch July 30/29 est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Not named, hull 265, steel hull, steam driven, patrol vessel for Supervisors of New York Harbor, 39 Whitehall Street, New York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam; 10'1½" mean draft; T. E. engs.; Babcock & Wilcox W.T. boilers: keel Apr. 6/29; launch 10/12/29 est.; deliver 12/12/29 est.

Not named, hull 266, steel hull freight and passenger tug for U. S. Dept. of Public Health, Boston; 91 L.O.A.; 20 molded beam; 9 draft; 350 H.P. Standard diesel eng.

SUN SHIPBUILDING COMPANY,
Chester, Penn.

Purchasing Agent: H. W. Scott.

Not named, hull 116, passenger and freight motorship for American South African Line, Inc., New York; 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs.; keel Mar. 14/29; launch Sept. 14/29 est.; deliver Nov. 15/29 est.

Cayuga Sun, hull 118, oil tank barge for Sun Oil Co.; 188'6" L.B.P., 31' breadth, 11'6" depth; 6000 bbls. capacity on 9ft. draft; diesel-electric propulsion; 2 Bessemer diesels, Westinghouse motors; keel Mar. 11/29; launched 7/10/29; deliver 7/22/29 est.

Seneca Sun, hull 119, sister to above; keel Mar. 18/29; launched 7/17/29; deliver 7/22/29 est.

Not named, hull 120, single-screw, diesel tanker for Sun Oil Co., 13,400 D.W.T.; keel 6/5/29; deliver 11/30/29 est.

No name, hull 122, sister to above.

Unnamed, hull 121, steel oil barge for Tidewater Oil Co., New York; 188'6" x 31' x 11'6"; 6000 bbls. capacity on 9' draft; keel 5/20/29; launch 7/18/29 est.; deliver 8/27/29 est.

TOLEDO SHIPBUILDING CO.,
Toledo, Ohio.

Purchasing Agent, Otto Hall.

Not named, hull 182, fire boat for City of Detroit; 125 L.B.P.; 29 beam; 10 loaded draft; 14 mi. speed; comp. engs.; 950 I.H.P.; 2 B. & W. boilers; deliver Aug./29 est.

TODD DRYDOCK, ENGINEERING & REPAIR CORP.,
Brooklyn, N.Y.

Purchasing Agent, H. J. Shannan.

Yorkville, hull 45, steel double - end ferryboat for City of New York, Dept. of Plant and Structure; 151 L.O.A.; 53 beam over guards; 37'6" molded beam; depth to top of beams 14'3"; draft 8'3"; steam engs.; keel Nov. 1/28; launched Mar. 28/29; delivered Apr. 5/29.

UNITED DRY DOCKS Inc.
Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Dongan Hills, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel June 13/28; launched Mar. 19/29; delivered June 11/29.

Pittsburg, hull 784, dredge hull for Atlantic, Gulf & Pacific Co.; 162 L.B.P.; 44 beam; 15 loaded draft; keel Feb. 26/29; launched 6/14/29.

Hull 785, pile driver for City of New York, Dept. Docks; 56x29x7'9"; keel 3/25/29; launch 5/11/29; deliver 6/17/29.

Unnamed, hull 790, tug for Standard Transp. Co., New York; 91'6"x22'x10'9"; 12 loaded speed; comp. eng. 500 I.H.P., 1 Scotch boiler; 12'6"x11'; keel June 29/29.

Unnamed, hull 791, tug, sister to above; keel June 29/29.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Captain George, hull 79, single screw tugboat for U.S. Engineers office, Galveston; 65'6"x17'x7'7½"; 190 B.H.P. Winton diesel eng.; keel Mar. 29/29; launched 6/24/29; sailed 6/30/29.

Beverly, hull 80, steel tug, U.S. Engineers, Philadelphia; 65'6"x17'x7'7½"; keel May 4/29.

Unique, hull 81, yacht for Harold M. Ward, Charleston; 50 x 12 x 4 ft.; keel June 4/29.

Repairs

BETHLEHEM SHIPBUILDING CORPORATION, LTD., Union Plant.

Drydock, paint, misc. repairs: Lena Luckenbach, Manoa, Ramon, Admiral Sebree, Tashmoo, Mahukona, Point Sur, Alvarado, General Smuts, City of Vancouver, Mericos H. Whittier, Maunalei, Nebraskan, D. G. Scofield, Harvard, U.S.S. Colorado, Robert Luckenbach, Capt. Gregory Barrett, schr. Chehalis, W. S. Miller, Katherine, Tamalpais, Solano, Prentiss, San Diego, Horace X. Baxter, Florence Olson, Mokilteo, ferry City of Sacramento, schr. Esther Johnson (also 1 forged steel tail shaft), U. S. Engineers' dredge San Joaquin, tug Gov. Markham, dredge Major Tilden, Crowley Barge L-3, yacht Alpha, U.S.C.G. cutter Golden Gate, garbage boat Hoquiam, whaler Hercules. Renew impeller shaft and bushings: schr. Carlos. Pipe repairs: m.s. Trocas, Athelmonarch, Hopemount, Bohemian Club. Propeller repairs: schr. Carlos, (also misc. repairs), stmr. Cadaretta. Misc. repairs: Utacarbon, Silverhelm, British Glory, Warwick, Geisha, Francis E. Powell, Anten, barge 1926, Mojave, Wallingford, Joseph Seep, Finnanger, C. O. Stillman, Cubore, Silveroak, Galena, S. A. Perkins, Pacific President, San Jose, Korrigan III, Tahiti, Limon, Silveray, San Mateo, Virginia, Washington, Esparta, Esther Johnson, Point Bonita, H. W. Baxter, Hartwood, Idaho.

COLLINGWOOD SHIPYARDS, LTD.,
Collingwood, Ont.

New tail shaft, hull painted: Miseford. Tail shaft inspection, hull repairs: Manitoulin. Tail shaft inspection, contra-propeller installed, bottom painted: vacht Venetia. Bow damage repairs, tail shaft inspected: Dalwarnic. Port side damage repairs, tail shaft inspected: Valcartier. Damage repairs, tail shaft inspection: Portsmouth. Hull caulked: dredge I.X.L.

PRINCE RUPERT DRY DOCK & SHIPYARD
Prince Rupert, B.C.

Docked, cleaned, painted, hull repairs: barge G.T.P. No. 1 Docked, cleaned, painted, misc. hull and engine repairs: 20 fishing boats. Misc. hull and engine repairs: 42 fishing boats. 80 commercial jobs.

U. S. NAVY YARD, Bremerton, Wn.

Misc. repairs and docking: Idaho, California, Omaha, Neches, J. D. Edwards, Reno, Percival, Henshaw, William Jones. Misc. repairs: Dellwood. Misc. repairs incident to operation as district craft: Mahopac, Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.

World commerce speaks a common language

[illegible] Shell [illegible] assume it. Simply notify [illegible] and you'll find it [illegible]

Who did What---and How

[illegible] illustration shows the world's [illegible] tug boat "Mikimiki", [illegible] of Shell diesel fuel. [illegible] tug boat is owned and operated [illegible] Young Bros., Ltd., of Honolulu [illegible] is giving very satisfactory ser[vic]e. The "Mikimiki" has an over[all l]ength of 127 ft., a beam of 28

[illegible] 560 h.p. [illegible] Fairbanks-Morse Diesel [illegible] Shell diesel [illegible] to be the best the market affords.

[illegible] Fort Armstrong [illegible] Mr. Hughes

has been on this vessel for several years and he states that the Shell Turbine Oil used on the Fort Armstrong is performing with great satisfaction.

The most important part of Turbine Oil," says Mr. Hughes, "is keeping it clean and free from water as much as possible. In order to do this we run the oil from the [illegible] through the separator about every three days. By running the separator two hours a day, the [illegible] Shell."

Below is a picture of the Steamer "Fort Armstrong" being filled with

Shell Turbine Oil which is pumped [illegible]

The Puget Sound Navigation Company operates a fleet of twenty-five ferries between all principal ports of the Sound and British Co-

[illegible] One of the popular ferry boat steamers is the "Seattle," which is powered with a triple expansion steam engine with a maximum speed of sixteen knots per hour. The steamer Seattle averages approximately one hundred and fifty miles in distance per day between Seattle and Bainbridge Island, carrying freight, automobiles and passengers.

This company uses a great deal of Shell Marine Lubricants with great satisfaction to the operating department.

Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

The annual joint meeting of the **Marine Service Bureaus** of Los Angeles Harbor and the Port of San Diego will be held at San Diego, August 15. At this meeting the officers of these bureaus will be elected for the coming year. **Captain W. J. Peterson**, head of the Marine Service Bureau of San Francisco and the father of the marine service bureau idea, will preside.

After the business session, during which ideas will be exchanged on various phases of the work, there will be a big get-together banquet at which the governor of Lower California will be the guest of honor. The ports of southern California are establishing profitable connections with Ensenada and other western Mexico ports, and it is hoped that this banquet may be just the beginning of a series of friendly "Hands across the border" functions that shall establish more cordial relationships with our neighbors to the south.

Joseph Dolan, United States Inspector of Hulls and Boilers, as president of the **Propeller Club** of San Francisco, announced at the second annual dinner on July 25 that on and after September 1, initiation fees for membership would be $10. More than one hundred new members have joined the organization during the last month, according to **Captain Stanley Allan**, secretary-treasurer.

According to **James A. Cronin**, marine superintendent of the **Standard Oil Company**, chairman of the Board of Governors, it is expected that the membership will reach 500 before the end of the year. Plans are being discussed looking forward to the selection of a site for the construction of a suitable clubhouse. It is highly probable that a selective piece of property along the Marina will be purchased and a beautiful clubhouse will be erected in the vicinity of Yacht Harbor, according to present plans.

Robert Martin, formerly with the San Francisco offices of **Luckenbach Line**, is now assistant to **E. S. Clark** of the **General Steamship Corporation**, handling the intercoastal business for the Shepard Line, for which General is agent.

Joseph Moreno, secretary of the **Marine Engineers' Beneficial Association** at San Francisco, has returned from San Pedro, where he has been relieving **Arthur Lovelace**, secretary of the San Pedro Marine Engineers, while the latter was on vacation.

Jeremiah J. Buckley, formerly chief engineer aboard the freighter Golden Coast, is now chief aboard the Oceanic & Oriental Navigation Company's carrier **Golden West**. **Charles A. Minich** is his first assistant engineer, having been promoted from second assistant.

William Stirling, chief engineer aboard the Panama Mail liner Guatemala, will shortly remove his home from New York to San Francisco. The chief, who is one of the most popular engineers sailing into San Francisco, has arranged for Mrs. Stirling to come here early this month.

B. L. Collins, former San Francisco manager for the sundries department of **Dodwell & Company** at San Francisco, has been shifted to Los Angeles to assume charge of this department, **Perry S. Newcomb**, manager, announced. Additional office space has been leased in the Dodwell headquarters in the Pacific Electric Building in Los Angeles for Collins' offices.

The engine room of the **Plow City**, one of the **Nelson** fleet, is now under the supervision of **Ernest DeKalb**, who relieved **Howard C. Dickerson**, who has been ordered to one of the vessels recently purchased by Nelson on the East Coast.

W. W. Royce is now manager of the marine insurance department of

---

FAIRBANKS-MORSE OFFICIAL SURVEY

John A. Manley, vice-president in charge of sales for Fairbanks, Morse & Co., Chicago, accompanied by his wife and by C. B. Jahnke, director of engineering for that firm, spent several weeks recently on the Pacific Coast surveying sales possibilities for Fairbanks-Morse products, particularly for the marine and stationary Fairbanks-Morse diesel engines.

The picture shown here was taken at Seattle and includes, from left to right, John A. Manley, Mrs. C. R. Miller, Mrs. John A. Manley, and A. W. Thompson, vice-president and Pacific Coast manager for Fairbanks-Morse. Mrs. Miller is the wife of C. R. Miller, Fairbanks-Morse manager for the Northwest Territory, stationed at Seattle.

Mr. Manley expressed himself as believing that the Pacific Coast territory is on the verge of a much greater expansion in the near future.

Rule & Sons, Inc. of Los Angeles. He succeeds **C. H. Williamson**, who has joined the **Kruetzer Aircraft Corporation** as vice-president and treasurer.

Royce is well known in Pacific Coast maritime circles, having been identified with **Wilcox, Peck & Hughes**, and the firm of **Johnson and Higgins**, as well as manager of the marine department of **John G. Johnson & Company.**

Captain S. S. Sandberg, former port traffic manager for the Port of Los Angeles, who is now a member of the United States Shipping Board, is at present on a tour of Europe inspecting maritime conditions. Captain Sandberg will return to the United States following the close of the Barcelona Exposition, as he is official representative at the Spanish exposition for the United States Shipping Board.

On an inspection tour of the Pacific Coast and also for the purpose of visiting his home in Portland, **Jefferson Myers**, United States Shipping Board Commissioner, has been calling on many of his old friends during the past few weeks.

After forty years afloat, **Captain Daniel Buckley** is retiring from the sea. He announced his retirement to friends on his voyage here as a passenger aboard the **Furness Line** motorship **Pacific Reliance.** He retires as senior commander of the Furness Line.

"Harbor Day" is to be celebrated by maritime and civic interests of San Francisco on August 22. The celebration is the first of its kind and is being sponsored mainly by the San Francisco Junior Chamber of Commerce.

Major Charles L. Tilden, president of the Board of State Harbor Commissioners, is one of the active leaders furthering plans for this celebration, in recognition of San Francisco being the second largest port in the United States.

Joseph E. Sheedy, vice-president of the **United States Lines**, delivered one of a series of lectures on safety at sea over national broadcasting radio network and sponsored by the National Safety Council.

His talk was well received. Sheedy is one of the active proponents of safety on shipboard, ever

Frank Gallagher, chief officer aboard the liner City of San Francisco, who has just received his master's license.

fostering the latest inventions and safety guards for the prevention of the loss of life and accidents on the high seas.

William Sykes, chief engineer for the last year aboard the **Panama Mail** liner **Venezuela**, is shore-side. He was relieved by **William W. Bowers**, formerly first assistant engineer aboard the liner **Colombia.**

The appointment of Bowers marks his first chief engineer-ship with the Panama Mail Line.

Chief Sykes is remaining shoreside for the present due to the illness of Mrs. Sykes.

Washington advices from Navy headquarters announced that **Chief Engineer George F. Harntnett** had

Captain Maynard Griffith, commander of the liner President Wilson.

been appointed lieutenant in the Naval Reserve. Harntnett is head of the engine room department aboard the **W. S. Miller.**

First Assistant Engineer William Cassems of the steamer **Ventura** was also notified of his commission as a lieutenant in the United States Naval Reserve.

O. G. Steen, general manager in the Far East for the **Dollar Line**, is boosting the efforts of the new China Nationalist Government for their rapid strides in commercial advancement, both in mechanical and industrial work in that country. Steen is here to confer with executives of the Dollar Line and will also visit Eastern cities before returning to his headquarters in Shanghai.

"The new government," Steen says, "is accomplishing much needed improvements and the work of the past year and a half augurs well for the future of the country."

Oceanic & Oriental Navigation Company has made Davao and Zamboanga regular ports of call in the Philippines and will initiate forty-two day service with the sailing of the steamer **Golden Hind**, according to **F. F. Allen**, assistant traffic manager of the line. Iloilo and Legaspi will also receive the same service beginning with the sailing of the **Golden Dragon** on August 24.

Hearings on **Matson Navigation Company's** application for part of the mail contract between this port and the Philippines was heard July 30, according to Washington advices. Washington was the headquarters for the hearing by members of the interdepartmental committee of the Postoffice Department. **Dollar Line** at present handles the mail to the islands.

Friday, July 12, **Captain Thomas Patrick Henry Whitelaw**, famous wrecker and salvage artist of Pacific waters, observed his eighty-fourth birthday. Modern salvage gear has put the veteran wrecker out of business, he declared in a conversation with Thomas Crowley, his old friend. Whitelaw, at 84, is still sturdy and ambitious to do things. He holds forth daily at his wrecking yards. Whitelaw resides in Piedmont with his wife. They have been married for fifty-nine years.

Chinese Nationalist Government has signed a contract with **Dollar Steamship Line** to permit the American company to use the new Shanghai short wave wireless station, capable of Pacific communication, for company business, according to recent advices by cable.

After 42 years service with the **P. & O. Line,** during which he rose to the post of marine superintendent, **Captain Sir F. B. Stuart Notley** has retired from active service with the company. He has been succeeded by **Captain W. H. Sweny.** Notley commenced his career on the seas at the tender age of fourteen, when he joined the clipper ship **Borealis** as cadet.

Norman Lind, former Pacific Coast manager of the **Ocean Transport Company's** intercoastal service, has been named general manager of the **Tacoma Oriental Steamship Company,** succeeding **E. W. Latie,** who goes to the **States Steamship Company** at Manila.

Walter Ropner of **Sir R. Ropner & Co., Ltd.,** one of the largest operators of British tramp tonnage, is expected to make a survey of the Pacific Coast shortly for the purpose of checking up on his company's chartering affairs. The customary rumors of a new service to be started by his line have resulted through the reports of his impending visit.

Herbert Seebohm, district manager of the **Swedish American Line,** has left for New York where he takes the line's motorship Gripsholm to Sweden. He expects to return to San Francisco September 1. While in the East and in the old country he expects to confer with officials of the line on the Pacific Coast situation.

Following the launching of the palatial liner **Pennsylvania, P. A. S. Franklin,** president of the **I. M. M.** said: "We will not be content until we have six steamers like this in service, providing weekly service between New York and west coast ports" and added that the company's program of building would be continued with construction of three more turbo-electric ships of the same type as the **Pennsylvania,** sister ship of the **California** and **Virginia,** now in commission in the intercoastal trade.

Captain F. E. Anderson, a master of Dollar Line ships, who is on furlough visiting his old home in Sweden.

As director of operations in Europe for the **United States Line, Captain Thomas Blau** has established headquarters in Bremen. Captain Blau is a well known Pacific Coast skipper. He has served many years abroad in a position similar to the one he now holds when the **United States Shipping Board** was operating many vessels in the trade to European ports.

After twenty-six years of seafaring, **Charles G. Hadicke,** veteran purser on ships of the **Dollar Line,** has quit the sea. With the arrival of the liner President Monroe, Hadicke made the announcement ending his service with steamship lines and a career which brought him into contact with world notables.

Chief Officer Robert W. Smith, Panama-Pacific liner California.

A plan to readjust the financial structure of the **International Mercantile Marine Company** is meeting with much favor in steamship circles of the Pacific Coast and is an important topic of discussion. There is a general feeling that the company has turned an important corner.

"Officials of the company feel that they are now free for a program of expansion," says **Leo E. Archer,** Pacific Coast manager. "The greatest benefit of such a program would accrue to the Panama Pacific Line. Completion of the third electric liner, the Pennsylvania, for the company gives it the three largest and most modern vessels built under the American flag."

Captain John K. Bulger, United States Supervising Inspector of Hulls and Boilers, has restored the licenses of **John Nairn** and **Thomas McDonnell,** chief and assistant chief engineer of the Alaska Packer tug **Kadiak.** Both had received a suspension of three months when the Kadiak was in trouble off Point Reyes. Appeals from suspension have also been filed by **W. Mairand** and **Charles Anger,** former engineers on the Panama Mail liner **El Salvador.**

Mexican States **Line** has withdrawn from the Pacific Coast United States ports-Mexican trade and their fleet of freight and passenger steamers is now laid up. The **Sinaloa** is to be sold, according to advices received by **Williams, Dimond & Company,** agents. The **Guerrero** and **Chihuahua** are at the Bethlehem yards, Alameda. Some months ago reports were rife that the line planned to replace the fleet with newer and more modern craft. **Captain G. A. Hancock,** financier of the Southern Cross flight to Sydney, bought the **Oaxaca** of the line about two years ago. She has since grounded in Alaskan waters.

Major Charles W. Cook, vice-president of **Swayne & Hoyt, Inc.,** is now in New York City on business for the company. Cook will study the steamship situation on the Atlantic Coast and will be gone several weeks.

Cunard Line has announced appointment of **Sir Thomas Brocklebank, Bart.,** as a member of the board of directors. He takes the place of his father. The house of Brocklebank, now affiliated with Cunard, is the oldest shipping concern in the world, having uninterruptedly carried on business since 1770, when it was founded by **Daniel Brocklebank** in the city of New York where Brocklebank was a shipbuilder. He started with five ships and when America's war for independence started Brocklebank returned to the mother country and continued activities from Liverpool. He had over 147 ships in service at one time and retired from activities in 1801.

Sir Thomas is the representative of the sixth generation of the famous house, all of whom have carried on the burden of the business in unbroken succession.

Major C. L. Tilden, president of the California Board of State Harbor Commissioners, is now studying at San Francisco the state-owned refrigerator terminal problem following his return from a trip abroad where he studied the terminal and port administration of some of the world's greatest harbors. Early solution of this problem is now assured.

The "man with a million friends," **Albert M. Saunders,** former chief steward of ships of the old Pacific Mail, Dollar Line, and European Lines, has opened a travel bureau in New York City and is greeting many world famous travelers at his headquarters. Saunders was a familiar figure in Pacific Coast steamship row for over twenty years. Saunders, a native of The Argentine, was educated in one of Spain's foremost universities. Shortly after receiving his degree he heard the call of the deep and up to a few months ago passed his years as a chief steward on famous liners plying out of San Francisco and New York.

Yoshi Kobayashi has taken over his duties as executive secretary of the **Nippon Yusen Kaisha Line** office at San Francisco. Kobayashi came here from the Callao office of the steamship company where he has spent the last three years and succeeds **K. Matsukama,** who is now general freight agent of the N. Y. K.

Roger D. Lapham, president of the **American-Hawaiian Steamship Company,** is the recipient of hundreds of letters and personal messages of congratulation from all parts of the United States, following the publication of an interesting article published in Current History Magazine. Mr. Lapham's article dealt with the importance of the Panama Canal as an invaluable aid to the development of the American merchant marine.

Stuart Guenther has been appointed district freight agent for the **Sudden & Christenson Arrow Line,** with headquarters in Seattle. He was for many years with the **Pacific Steamship Company.**

William W. Bowers, recently appointed chief engineer of the Panama Mail Liner Venezuela. Bowers was formerly first assistant on the Columbia.

Steamship operators, especially those engaged in the passenger trade, are watching with interest how the action of the Grace Line works out in reference to having women serve as waitresses, replacing men.

The first ship to make the change was the new motorship **Santa Barbara,** one of the finest passenger liners under the Grace flag. She is operated between New York and South American ports.

Setting the course on the present world-trip of the **Dollar** liner **President Wilson** is **Captain Maynard Griffith,** formerly chief officer of the **President Jackson.** He is relieving **Captain F. E. Anderson,** who is now en route to his old home in Sweden.

Captain Anderson will return as commander of the **President Wilson.**

Close to a quarter of a century service with the **Pacific Steamship Company** was severed by **Ralph Lambert** as city ticket agent when he joined the **Matson Navigation Company,** with headquarters in San Francisco. Lambert is regarded as one of the best passenger agents on the West Coast.

W. H. (Dick) Wallace, formerly purser on vessels of the **Pacific Steamship Company,** is now chief clerk to **Carl Strout,** district superintendent of the company in Seattle. He succeeded to the position vacated with the resignation of **Joseph L. Carman Jr.,** who has become general manager of the **Alaska Airways.**

To meet a growing demand, a new service for shipowners and shippers has been developed by the Bureau of Operations of the United States Shipping Board in cooperation with the Board of River and Harbor Engineers of the War Department.

The service embraces an annual publication entitled **Port and Terminal Charges at United States Ports** and covers current information regarding channel location of bridges, terminal facilities, volume of commerce, pilotage, towage, dockage, and other data relating to principal ports of the United States.

Harvey M. Huff, San Francisco representative for the **United Fruit Company,** is now making a tour of the Spanish Americas, aboard the steamer **La Perla.** He was accompanied by Mrs. Huff.

Graham Smith, West Coast branch manager of **Crane Packing Company,** announces that the growth of its business of supplying the Pacific Coast shore and marine field with "John Crane" flexible metallic packings has necessitated the removal of the San Francisco quarters to 112 Ninth Street, where the company now has more space and better facilities for handling stocks and giving users of its products better service.

Trade, Traffic and Shipping

(Section continued from Page 323)

First Regular Direct Service to Philippines

ARRIVAL of the Matson Line freighter Maliko at Manila on August 4, instituting the new Manila direct service of the Matson Navigation Company of San Francisco, largest privately-owned American steamship line on the Pacific, will mark the opening of another chapter in the book of friendship between the Pacific Coast ports, Hawaii, and the Philippines. The Maliko sailed July 12 from San Francisco on Voyage No. 1 to Manila.

The Matson Line and its founder, the late Captain William Matson, who passed away in San Francisco in 1917, are no strangers to Manila. Captain Matson, it will be remembered by the older generation of Manila business men, as a member of the firm of Matson, Lord & Belser, built part of Manila's waterworks system many years ago. During the World War the Matson steamer Manoa, of the line's San Francisco-Hawaii service, called regularly at Manila, carrying both freight and passengers.

Recognizing the need for a direct freight service from Manila, Iloilo, and Cebu to Honolulu and San Francisco, the Matson Line has brought this service to the Philippine Islands. The modern 13-knot freighters Maliko, Maunawili, and Maunalei will maintain a regular schedule with sailings every 28 days from Los Angeles and San Francisco for Manila. All these ships have space for refrigerated cargo and can carry from 8500 to 10,000 tons of freight each.

This fall the Matson Line's flagship, Malolo (Flying Fish), fastest and finest ship on the Pacific, will visit Manila on the San Francisco Chamber of Commerce-American Express Travel Department Around-the-Pacific Cruise. The Malolo will arrive at Manila on the morning of October 28, remaining until noon of the 29th. Her passengers will be taken on motor trips to Fort McKinley, the Spanish cathedrals, and historic Fort Santiago in the Walled City. Tiffin will be served at the Manila Hotel. In the afternoon, the drive will be continued to other points of interest, including a call at Bilibid Prison at 4 p. m. for "Retreat."

Founded in 1882 by Captain William Matson, the Matson Line now operates passenger and freight services from San Francisco, Seattle, and Portland to Honolulu, and from San Francisco to Hawaii, Samoa, Fiji, and Australia. It also is joint owner with the American-Hawaiian Steamship Company of the Oceanic & Oriental Navigation Company, operating freight steamers to Australia, New Zealand, the Orient, and Philippines. The Matson fleet alone now numbers 25 ships, including the Malolo, fastest and finest ship on the Pacific, with a speed of 21 knots and a schedule of four days from San Francisco to Honolulu. Two new liners will shortly be ordered for the Australian passenger service.

Present Conditions in Trade With Latin America

REPORTS filtering through the United States Department of Commerce and mostly as of the latter half of June, 1929, indicate that the conditions of trade in Latin America are very much like present conditions in the United States, "Fundamentally sound from an economic viewpoint."—"Wholesale trade rather slow."—"Retail trade continues better than last year."—"Consensus of opinion is that business will improve toward the end of the year." So read the reports from Colombia to Chile and from Venezuela to Argentina and from all the Central American republics.

Cuba, Honduras, and Guatemala are the exceptions. Cuba had a much larger sugar crop than last year and netted five and a quarter million dollars more from that product in the first six months of 1929 than in the similar period of 1928. She also received four million dollars more from tourists this season than last. This money, being widely distributed, greatly increases purchasing power and has resulted in much heavier imports from the United States.

Honduras reports large increase in banana exports and a high level of imports, with business very good.

The decided improvement of import volume in Guatemala as of June, 1929, is probably due to advance purchases before the new tariff, which went into effect July 1. Both wholesale and retail business, however, are reported fair, with collections good.

In Mexico, although business is at present decidedly dull, there is substantial progress being made along some fundamental lines. Internal communication is being steadily improved. Telephone and telegraph installations are being bettered and widely extended. Much progress is being made on highway construction. Aviation is being encouraged. Better fiscal administration is being established by the government.

In the Argentine, the lumber trade is developing a condition very interesting to Pacific Coast exporters. The River Plate market for soft lumber has been supplied largely in the past with pine from the Parana district of Brazil. In the last few years Southern yellow pine and Douglas fir from the United States, together with spruce from Europe, have been crowding out the Brazilian product by offering a better grade of material, more perfectly milled, at a lower price. Fifty-five million feet of Douglas fir, or Oregon pine, was shipped into this market in 1928. As the Southern yellow pine is fast disappearing this looks like a very promising market for Pacific Coast lumber.

The United States Department of Commerce has an excellent bulletin on the "Parana Pine Lumber Indus-

try of Brazil", known as Trade Information Bulletin No. 493, price 10 cents, which should be studied by American lumber exporters.

Port Construction Notes

Canada. The Canadian Government has authorized the expenditure of $29,000,000 for the development of certain ports of the Dominion. Montreal will receive $10,000,000; Vancouver $10,000,000; Halifax, $5,000,000; Three Rivers, $2,000,000; and Chicoutimi, $2,000,000.

Victoria. Department of Public Works of the Dominion Government will ask for tenders about August 1 for the development work at the Ogden Point piers, the work involving the construction of a concrete protection wall at the end of Pier A and Pier B.

Venezuela. The government of Venezuela has surveyed the Bay of Turiamo and engineers are drawing up plans for a port to be located at this point. Engineers plans are for dredging of a lake connected to deep water and the construction of wharves, customs buildings, a free port, hydroplane base, freight carrying aerial cable over the mountains to Maracay, and a hydro-electric plant.

Portland. The MacDonald Engineering Company will build reinforced concrete grain storage bins at the Union Pacific grain terminal at a cost of $31,069. Kerr, Gifford & Company is the lessee of the property. The bins are to be 78 feet high, including the gallery.

Tacoma. The Pierce County Port Commission opened bids recently for the construction of a cold storage plant on the waterfront. Low bids were as follows for the construction of the building:

Puget Sound Bridge & Dredging Company, Seattle, $204,986, including cork and piping; Albertson and Cornell Brothers, Tacoma, $242,686.

For refrigeration machinery, the bids were: Carbondale Machine Company, $55,000; Edward Lee Machine & Supply Company, $55,386; York Ice Machine Corp., $60,750.

Oakland. The western waterfront will see considerable activity within the next thirty or sixty days, when the first big terminal and warehouse is occupied by Rosenberg Bros. The second fine new unit of the western waterfront development —a similar warehouse and terminal for Libby, McNeil & Libby—will be ready this fall. The Port Commission is working on plans for the extension of the Fourteenth Street wharf. A steel water tank, 100 feet high, 100,000 gallons capacity, is to be erected at the terminal for additional fire protection.

The State Railroad Commission has granted permission to the Lawrence Warehouse Company to conduct a cold storage warehouse at Water and Webster Streets.

Alameda will develop a suitable yacht basin and hydroplane base to take care of the growing fleet of pleasure boats which seek anchorage on the Alameda waterfront. A basin will be excavated on a portion of submerged land under lease to the airport.

Los Angeles. The Los Angeles Compress and Warehouse Company is to build a reinforced concrete warehouse at the rear of Berth 56, outer harbor, over the original warehouse now in use, to cost about $200,000. A similar warehouse is to be built on the fill directly south of the outer harbor viaduct. Both warehouses will cost a total of $530,000. F. E. Zumwalt, engineer associated with Robert J. Cummins of Houston, Texas, is at San Pedro completing construction plans for the new warehouses.

E. B. Thebaud of San Pedro has requested a 30-year lease of 3.25 acres and frontage on West Basin on which to construct a cold storage warehouse.

Long Beach. The Ford Motor Company is seeking permission from the Army Engineers to modify their authority to construct a pier on the waterfront. Present plans are to construct a wharf and dolphins on its property along Cerritos Channel and the basin connected thereto.

Freights, Charters, Sales

July 19, 1929.

THE following steamers have been reported fixed with grain to U.K. Continent: British steamer Rio Azul, North Pacific to U.K./Continent, August, Kerr, Gifford and Company; British steamer Temple Lane, British Columbia to U.K./Continent, $1.30, August/September, Canadian Transport Company; a steamer, Columbia River or Puget Sound to U.K./Continent, 28/3, August/September.

The British steamer Pennyworth has been fixed with grain from Vancouver, B. C., to Shanghai, $4, July, Canadian Cooperative Wheat Producers Association.

The Fin steamer Kastelholm has been fixed with lumber from two ports North Pacific to two ports Australia, $12.50, September, by American Trading Company.

The following steamers have been reported fixed with lumber for the Orient: American steamer Heber, Coos Bay and Columbia River to Shanghai, $8.50, Dant & Russell; British steamer Gogovale, North Pacific to Shanghai, $8, August, Canadian American Shipping Company; British steamer Southgate, Grays Harbor or Puget Sound to Shanghai, July, Canadian-American Shipping Company.

The following steamers have been reported fixed with lumber to the Atlantic: British steamer Tilsington Court, British Columbia to North Hatteras, July, Canadian American Shipping Company; British steamer Silverpine, British Columbia to North Hatteras, $10.50, August, Seaboard Lumber Sales Company.

The following time charters are reported: a steamer, Pacific Trade, delivery North Pacific, redelivery U.K./Continent, $1.40, June, July; Norwegian steamer Lionel, delivery Hongkong, July, redelivery Port Sudan, via North Pacific, $1.35, Canadian Transport Company.

The American steamer Mexico has been sold by New York and Cuba Steamship Company to Alaska Steamship Company, Seattle, terms private.

PAGE BROTHERS, Broker.

Trade Note

Griscom-Russell Company has established a new sales office at the Lewis Building, Portland, Oregon, to handle its Reilly and Bentube evaporators for producing distilled water for boilerfeed make-up; U-Fin generator air coolers to cool the air from generator windings; Multi-whirl coolers for cooling the oil from turbine bearings, reduction gears, or transformers, or for cooling the jacket water from diesel engines; Bleeder heaters for using the steam bled from turbine stages to preheat the boiler feed; and expansion joints for low pressure steam lines.

Salvaging of the Anne Hanify

AFTER stranding on the beach near Point Arguello recently, the coastwise lumber steamer Anne Hanify was practically given up as a total loss. Dave Young, surveyor for the San Francisco Marine Underwriters, decided that there was a good chance to pull her off, and after survey of the hull on the beach sent to San Francisco for the big Haviside wrecking barge.

On the night of July 4 the barge left at short notice in tow of the Red Stack tug Fearless. The tug and her tow arrived at the reported position of the Anne Hanify at 12:30 a. m. July 7. Not finding the wreck, they lowered a launch, which cruised around and located the Anne Hanify three miles south and, about 6 a. m., the barge was anchored as close to the wreck as possible.

The surf prevented any getting ashore at that piont, and instructions were wig-wagged to the barge by Dave Young standing on the cliff. A launch was backed into the hull of the Anne Hanify with a messenger line and by noon three cables were made fast to the hull on the beach. The derrick barge then waited until the high tide at night to begin heaving. She was moved a little on the next day and then two days were spent in jettisoning the lumber cargo. During these two days the sea moderated and on July 10 a gasoline engine driven pump was put aboard which was able to keep the water down in the hold and enable the ship to rise a little. At 10 o'clock on the night of July 11 she began to move slowly and at 2 a. m. on July 12 she was afloat and clear.

The Coast Guard cutter standing by radioed to San Pedro, and the Red Stack tug Sea Rover was alongside and took the Anne Hanify in tow for San Pedro at 11:15 p. m.

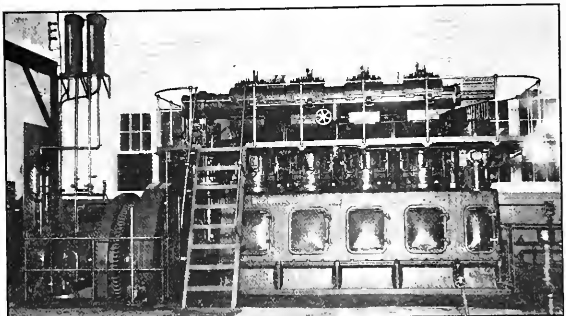
The Haviside derrick barge was under command of Robert Crawford. Everything aboard worked perfectly, all gear operating without hitch. Another first-class salvage job to the credit of Haviside Barge No. 4 and Surveyor Dave Young, not forgetting Commander Hayes of the Coast Guard cutter Algonquin, who stood by during the whole performance and cooperated in every way possible.

A Remarkable Record

A REPORT from Elko, Nevada, states that a 356-horsepower Busch-Sulzer diesel engine used in the generating plant of the Elko Lamoille Power Company completed 6567 consecutive hours of operation on May 13 at 4:15 p.m., and set what is thought to be a world's nonstop running record for this type of engine. According to the report, this is the third long nonstop run the engine has made. On one run which began November 26, 1926, and ended April 16, 1927, and another which began September 19, 1927, and was completed April 17, 1928, the oil engine operated 3261 and 5038 hours, respectively, without a shut-down.

This engine has been in operation in the Elko plant of the Elko Lamoille concern, which also operates a plant in Lamoille, supplying power to Lamoille and Elko, since 1922, and is one of three units which are connected to the 2300-volt, 60-cycle, General Electric generators and exciters in that plant.

Upkeep on the engine has been remarkably low, according to Ray G. Chester, engineer of the company, who, in commenting on the service obtained, said: "The cost of parts and gaskets during the more than seven years of service has been less than a dollar a week. The engine uses Union Diesel Heavy oil in the crank case and cylinders and Union Compresor oil in the air compressor. A careful check of all bearings is made each year, but it has not yet been necessary to take up any crank, main, or wrist pin bearings in more than 19,000 hours of running."



The 356-horsepower, Busch-Sulzer diesel at Elko, Nevada, which has recently completed a nonstop run of 6,567 hours.

New Shipping Firm

AFTER nineteen years service, Albert Davidson, general freight agent for the Canadian National Steamships, Ltd., at Vancouver, recently resigned his position with that company to enter private business. Mr. Davidson will take over the office of managing director of the newly formed Vancouver Shipping Company, Ltd., and associated with him will be Hardinge-Barret-Lennard, at present in England, and well known in British Columbia financial circles, and W. B. (Bev.) Davidson.

Offices of the new firm will be located in the Credit-Foncier building, Vancouver, and the company will act as freight and grain brokers and shipping agents.

Mr. Davidson, who took up his new duties on July 1, has spent a number of years in transportation, having commenced his career in the foreign freight department of the Canadian Pacific at Montreal, and subsequently with the Grand Trunk Pacific at Prince Rupert and Vancouver before that line was taken over by the Canadian National.

Chain for Cranes, Dredges, and Heavy Duty is the title of an interesting and helpful pamphlet just issued by the American Chain Company, Inc., Bridgeport, Connecticut.

Diesel Yacht Lotusland

A Sturdy Motor Vessel with Some Novel Designed Features

THERE is now under construction at the yard of The Pusey & Jones Corporation, Wilmington, Delaware, a new diesel yacht Lotusland, designed by Cox & Stevens, Inc., which has several novel features.

The dimensions are:

Length over-all	206'0"
Length on water line	169'0"
Beam	28'0"
Draft	12'6"

She is ruggedly built of steel with teak decks, high bulwarks, steel deckhouse on the main deck, and two steel deck houses on the weather deck.

The design is of the continuous sheer, clipper bow, transom stern type, associated with a large stack nearly amidships, two pole masts, and a proper grouping of the deck houses, giving the vessel a workmanlike and smart appearance.

Her main power plant consists of two 6-cylinder Winton diesel engines of 500 horsepower each, and she will have unusually large, full diesel auxiliaries of Winton manufacture, as well as all the necessary pumps and auxiliaries for ship service and sanitary system.

She will be fitted with a Sperry gyroscopic stabilizer, and a complete line of Sperry navigating equipment.

Fuel oil and water storage capacity, sufficient for a cruise of 10,000 miles, is below decks in the bilge, taking up no useful space whatsoever.

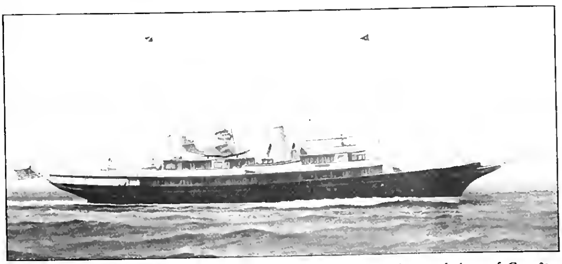
Public rooms for the owner and his guests are all situated in the main deck continuous deckhouse, dining room being in the forward end, followed by the pantry; the library and living room being at the after end, connected with the dining room by an inside passage. From this passage and from the living room two companion stairs run to the berth deck quarters aft, and a comfortable stairway runs to the weather deck.

The dining room, library, and living room are all large in size, well proportioned, and will be most attractively furnished and decorated. In the library and living room, fire places are provided.

This yacht is unusual in that on the upper or bridge deck the after deckhouse, which is much larger than customary and much wider, is used to form two unusually comfortable staterooms, each with separate bath, these to be used by the owner and his wife when cruising in the tropics. On the berth deck there are five large staterooms for guests, each double and each having a separate bath, as well as comfortable quarters for maids and valets, a large linen room and stowage space.

One of the spaces on the berth deck aft that would usually be used as a stateroom has been assigned to house the pipes for a special organ that is being designed for the yacht, and which will be operated from a console in the living room. This installation is being worked out with the greatest of care, and the manufacturers are confident that a splendid tone and excellent effect will be secured.

Another novelty is that arrangements are being made to carry a Loening amphibian plane on the top of the after deck house on the deck. This plane will be lifted on and off the yacht by a boom attached to the main mast, and will be part of the yacht's regular equipment. This feature is entirely novel, and will permit the owner when entering port to leave the yacht before arrival and complete his journey in rapid time, or it will also allow him to follow the yacht after she has left port and join her at sea or on her way to some adjacent port.



The Lotusland, now building at The Pusey & Jones Corporation to designs of Cox & Stevens, Inc. Note the hydroplane carried aft of the funnel.

Monel Absorbs Vibration

(Continued from Page 331)

periodic vibration. Second, the Monel Metal apparently absorbed and dampened simple vibration and confined it to the engine. Testimony of the experts on the trials was that at the ends of the Monel Metal framing no vibration or sound from vibration could be distinguished, even with the teeth.

Later on, the same engineers had occasion to mount a marine engine athwartship using an off-center mounting and connecting to the propeller through a worm gear and worm. Remembering their experience with the canoe, they decided to mount this engine with a framework of Monel Metal. This framework extended about 6 feet forward and 10 feet aft of the engine, the frame being built as a rigid girder. The ends of this frame were anchored at the center point of the stringers in the framework of the bed, these stringers extending 10 feet forward and aft at the forward end of the Monel frame and 6 feet forward and aft at the after end. This Monel frame effectively damped out vibration before it reached the wood framing and all periodical vibration was eliminated with the off-center mounting of the motor in the frame.

This quality in Monel Metal will recommend itself to engineers in many applications and will be very valuable to the designers of fast motorboats and cruisers.

Announcement has been made by Balfour, Guthrie & Company that the lumber department of the company will be centralized in Seattle, with Robert S. M. Nicholson in charge.

Diesel Yacht Lotusland

A Sturdy Motor Vessel with Some Novel Designed Features

THERE is now under construction at the yard of The Pusey & Jones Corporation, Wilmington, Delaware, a new diesel yacht Lotusland, designed by Cox & Stevens, Inc., which has several novel features.

The dimensions are:

Length over-all	206'0"
Length on water line	169'0"
Beam	28'0"
Draft	12'6"

She is ruggedly built of steel with teak decks, high bulwarks, steel deckhouse on the main deck, and two steel deck houses on the weather deck.

The design is of the continuous sheer, clipper bow, transom stern type, associated with a large stack nearly amidships, two pole masts, and a proper grouping of the deck houses, giving the vessel a workmanlike and smart appearance.

Her main power plant consists of two 6-cylinder Winton diesel engines of 500 horsepower each, and she will have unusually large, full diesel auxiliaries of Winton manufacture, as well as all the necessary pumps and auxiliaries for ship service and sanitary system.

She will be fitted with a Sperry gyroscopic stabilizer, and a complete line of Sperry navigating equipment.

Fuel oil and water storage capacity, sufficient for a cruise of 10,000 miles, is below decks in the bilge, taking up no useful space whatsoever.

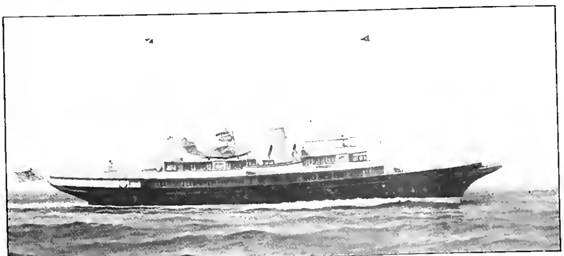
Public rooms for the owner and his guests are all situated in the main deck continuous deckhouse, dining room being in the forward end, followed by the pantry; the library and living room being at the after end, connected with the dining room by an inside passage. From this passage and from the living room two companion stairs run to the berth deck quarters aft, and a comfortable stairway runs to the weather deck.

The dining room, library, and living room are all large in size, well proportioned, and will be most attractively furnished and decorated. In the library and living room, fire places are provided.

This yacht is unusual in that on the upper or bridge deck the after deckhouse, which is much larger than customary and much wider, is used to form two unusually comfortable staterooms, each with separate bath, these to be used by the owner and his wife when cruising in the tropics. On the berth deck there are five large staterooms for guests, each double and each having a separate bath, as well as comfortable quarters for maids and valets, a large linen room and stowage space.

One of the spaces on the berth deck aft that would usually be used as a stateroom has been assigned to house the pipes for a special organ that is being designed for the yacht, and which will be operated from a console in the living room. This installation is being worked out with the greatest of care, and the manufacturers are confident that a splendid tone and excellent effect will be secured.

Another novelty is that arrangements are being made to carry a Loening amphibian plane on the top of the after deck house on the deck. This plane will be lifted on and off the yacht by a boom attached to the main mast, and will be part of the yacht's regular equipment. This feature is entirely novel, and will permit the owner when entering port to leave the yacht before arrival and complete his journey in rapid time, or it will also allow him to follow the yacht after she has left port and join her at sea or on her way to some adjacent port.



The Lotusland, now building at The Pusey & Jones Corporation to designs of Cox & Stevens, Inc. Note the hydroplane carried aft of the funnel.

Monel Absorbs Vibration

(Continued from Page 331)

periodic vibration. Second, the Monel Metal apparently absorbed and dampened simple vibration and confined it to the engine. Testimony of the experts on the trials was that at the ends of the Monel Metal framing no vibration or sound from vibration could be distinguished, even with the teeth.

Later on, the same engineers had occasion to mount a marine engine athwartship using an off-center mounting and connecting to the propeller through a worm gear and worm. Remembering their experience with the canoe, they decided to mount this engine with a framework of Monel Metal. This framework extended about 6 feet forward and 10 feet aft of the engine, the frame being built as a rigid girder. The ends of this frame were anchored at the center point of the stringers in the framework of the bed, these stringers extending 10 feet forward and aft at the forward end of the Monel frame and 6 feet forward and aft at the after end. This Monel frame effectively damped out vibration before it reached the wood framing and all periodical vibration was eliminated with the off-center mounting of the motor in the frame.

This quality in Monel Metal will recommend itself to engineers in many applications and will be very valuable to the designers of fast motorboats and cruisers.

Announcement has been made by Balfour, Guthrie & Company that the lumber department of the company will be centralized in Seattle, with Robert S. M. Nicholson in charge.

Pacific Marine Review

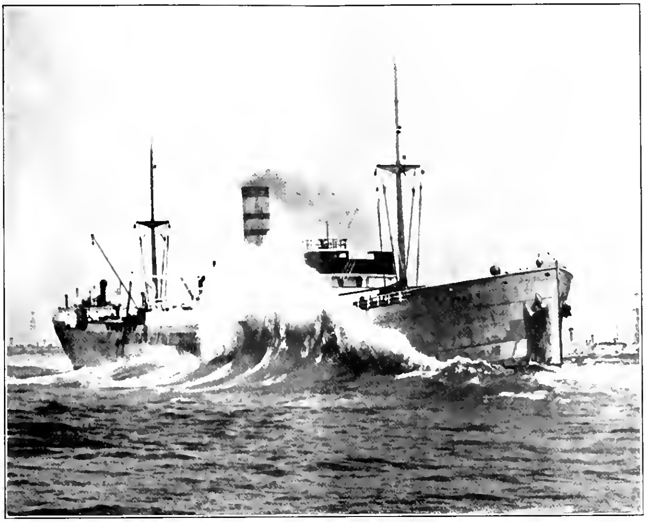
The National Magazine of Shipping

SEPTEMBER, 1929

Official Organ
PACIFIC AMERICAN

Official Organ
SHIPOWNERS' ASSOCIATION

Pacific Marine Review, Vol. 26, No. 9, Published Monthly at 576 Sacramento Street, in San Francisco, Entered as second class matter at the post office at San Francisco under the act of March 3, 1879.



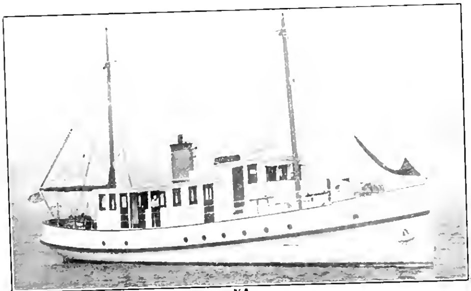
A BREAKWATER FOR A DAY

This unusual picture shows the steamship Evanger stranded on the beach at Long Beach, California. The Black Horse salvage fleet took charge, and she was promptly pulled off, little the worse for her experience.

The "Anna Helen", of Kodiak, Knows her Alaska and her engines---

Dr. W. F. Good, who has hunted and fished in Alaska for many years, knows what stuff a boat must have to weather the seas and ice of these northern waters. And in his motor yacht, "Anna Helen", he has built sturdiness and seaworthiness for arduous cruises. Carrying this sturdiness into the boat's power, Dr. Good has installed a 3-cyl., 100 H.P. Washington Diesel Engine.

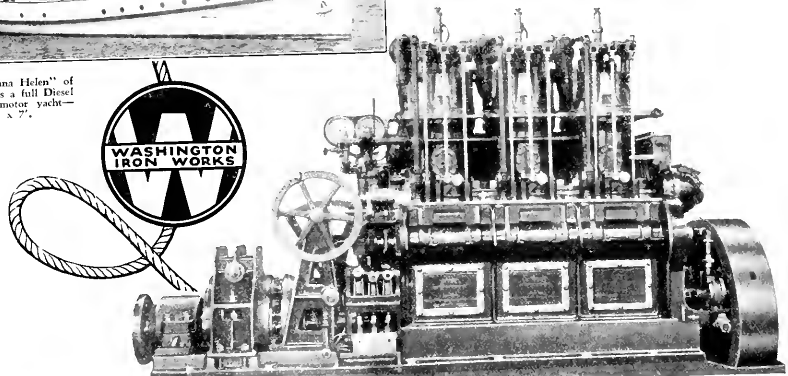
Washington Diesels solve the power problem of every type of boat and the records they have made in long runs under varying conditions and in economy are worth inquiry. Write.



The "Anna Helen" of Kodiak, is a full Diesel cruising motor yacht—70' x 17' x 7'.

WASHINGTON IRON WORKS
General Offices, Seattle, Washington
Portland Office, 524 Marshall St.

British Columbia Representatives: Vancouver Machinery Depot, Ltd., Vancouver, B. C., Canada. Honolulu Representatives: Perine Machinery Company, Inc., Alexander & Baldwin Bldg., Honolulu, T.H. Oregon Representative: F. C. Purinton, Phone 62, Tigard, Ore. Eastern Representative: Sexton Engineering Corporation, 136 Liberty Street, New York City, N.Y. California Agents: W. H. Worden Co., Inc., San Francisco, Calif.; Ward-Livesly Co., Los Angeles, Calif. Southern Representative: Eclipse Engineering Co., 321 Chartres Street, New Orleans, La.



WASHINGTON DIESEL ENGINES

Pacific Marine Review

VOLUME XXVI | SAN FRANCISCO, CALIF. | NUMBER 9

American Foreign Trade and Shipping

A Comprehensive Analysis of Overseas Transport of American Commerce

By Alfred H. Haag, Director,
Bureau of Research, United States Shipping Board.

ONE of the most comprehensive studies of the volume of American foreign trade and shipping ever undertaken has just been completed by the Bureau of Research of the United States Shipping Board. A summary of the high spots of the report discloses that 5100 vessels of 23 million gross tons flying the flags of 28 countries participated in the carriage of American foreign trade in the fiscal year 1928, transporting 1,750,000 passengers and 100 million tons of cargo valued at nearly eight billion dollars.

The combined passenger and freight revenues approximated one billion dollars.

The percentage of cargo carried by American ships was one-third of the total in value and forty per cent. in volume. Twenty-eight per cent. of the passengers were transported in American ships.

Comparing the carriage of American foreign trade in American ships during the decade ended 1914 with that of the past decade, the figures disclose a marked increase in the percentage and value of cargo carried in American ships. In the decade ended 1914, the average carried in American ships was slightly more than ten per cent. of the total value of our foreign trade, while in the decade ended June 30, 1929, it averaged better than thirty-six per cent. In view of the fact that the value of our foreign trade in the decade just concluded has been more than double that of the decade ending with 1914, it is significant that the twenty-six per cent. gain in the transportation of our foreign trade carried in American ships involved an advance from an annual average of 300 million dollars during the decade 1905-1914 to an average of two billion six hundred million dollars in the decade 1920-1929, an increase in value of more than 700 per cent.

United States vessels of 100 gross tons and over taking part in our foreign trade during 1928 numbered 1811 of 7,462,000 gross tons, consisting of 135 combination passenger and freight carriers, 1001 general cargo vessels, 270 tankers, one refrigerator, 155 sailing ships, and 249 barges.

British vessels numbered 1734 of eight million gross tons and included 129 combination passenger and freight carriers, 1145 general cargo ships, 209 tankers, 33 refrigerators, 101 sailing ships, and 117 barges. British vessels handled thirty per cent. of the tonnage volume of our 1928 water-borne foreign commerce.

Other foreign flag vessels employed in the transportation of the 1928 foreign commerce of the United States included 399 Norwegian ships of 1,460,000 gross tons, which carried 8 per cent. of the total trade; 199 Japanese vessels of 1,240,000 tons, which carried 4 per cent. of the total tonnage volume; 161 Italian ships of 1,000,000 gross tons carried 2½ per cent. of the trade; 150 German ships of 890,000 gross tons carried 2¾ per cent. of the total cargo volume; 127 Dutch vessels of 677,000 gross tons carried 2¾ per cent. of the foreign trade; 122 Danish ships of 431,000 gross tons carried 2½ per cent. of the total cargo; 104 Swedish vessels of 418,000 gross tons carried 2¼ per cent.; and 90 French ships of 623,000 gross tons carried 2 per cent. of the total cargo tonnage moved in the water-borne foreign trade of the United States in 1928.

Ships of 18 other nations participating in the 1928 water-borne foreign trade of the United States numbered 200 of 785,000 gross tons. The cargo tonnage handled by these 200 vessels aggregated less than 4 per cent. of the total traffic. The nationalities represented by these vessels included: Spain, Honduras, Belgium, Greece, Panama, Brazil, Danzig, Mexico, Nicaragua, Portugal, Venezuela, Chile, Peru, Finland, Cuba, Russia, Colombia, and Argentina.

Bulk commodities comprising petroleum, grain, sugar, coal, lumber, ores, and fertilizers constituted 73 per cent. of the total trade. The bulk traffic in tankers was nearly 29 per cent. of the total trade, the remaining 44 per cent. being transported in other types of carriers. The total tonnage carried by vessels other than tankers was approximately 72,000,000 tons, of which 44,000,000 tons was composed of dry bulk commodities. Of the total 40,000,000 tons carried by American flag ships, 30,000,000 tons, or 75 per cent., was made up of bulk commodities. Of the total 60,000,000 tons carried by foreign flag ships, 42,000,000 tons, or 71 per cent., was made up of bulk commodities.

In the fiscal year 1928, approximately 70 per cent. of the entire water-borne commerce of the United States was carried in direct trade, the remaining 30 per cent. being carried by foreign vessels plying between the United States and foreign ports not located in their own countries.

Of particular interest is the growth of American flag services since 1914, when the total ocean-going American merchant marine employed in foreign and non-contiguous services consisted of fifteen foreign services and five non-contiguous services operating a total of 112 vessels of less than 600,000 gross tons.

At the present time the ocean-going American merchant fleet employed in established lines in foreign and non-contiguous trades consists of 671 vessels of over 3,865,000 gross tons. This shows a 500 per cent. in-

crease in numbers and nearly 550 per cent. in tonnage since 1914. With few exceptions these vessels are of 2000 gross tons and over and 66 per cent. of the number and 65 per cent. of the gross tonnage are now under private ownership.

During the height of government activities in the shipping business the United States Shipping Board had under its jurisdiction in vessels contracted for, requisitioned, commandeered, seized, transferred, chartered, and purchased 4500 ships of over seventeen and one-half million gross tons.

This enormous tonnage has been reduced to the present total of less than 3,280,000 tons, comprising 595 ships still remaining under control of the United States Shipping Board, of which 229 vessels of 1,335,000 tons are in active service.

The Shipbuilding Status

Analysis of World Shipbuilding by the National Council of American Shipbuilders

THE following analysis was made by the National Council of American shipbuilders: Lloyd's Register of shipping states that for vessels above 100 tons gross there were 2,838,225 tons gross under construction in the world at the close of the quarter ended June 30, 1929.

This tonnage was distributed as follows:

	Gross Tonnage	Percent of Total
Great Britain and Ireland	1,453,906	51.3%
Germany	272,444	9.6%
Japan	179,968	6.3%
Holland	172,406	6.1%
France	139,316	4.9%
Russia	124,908	4.4%
UNITED STATES	119,098	4.2%
Sweden	89,517	3.1%
Italy	73,861	2.6%
Denmark	68,009	2.4%
Other Countries	144,792	5.1%
Total	2,838,225	100.0%

Of these vessels, 21 are of 15,000 tons gross and above, 14 being motorships and 7 being steamships.

It will be noted from the above table that the United States occupies seventh place in tonnage under construction.

Tonnage launched in this quarter was about 20,000 gross tons in excess of new work begun.

Marine Engine Construction

Values of reciprocating and oil engines are indicated horsepowers; for turbines are shaft horsepowers. Turbine engines built in Germany are omitted.

	Quarter Ended Jun 30, 1929	Quarter Ended Mar. 31, 1929	Quarter Ended Jun 30, 1928	Average Quarter For 1928
Steam recip. eng's	571,271	573,508	491,750	485,255
Steam turbines	429,700	484,600	214,600	291,498
Oil engines	1,250,963	1,238,675	1,252,960	1,269,730
Total horsepower	2,251,934	2,296,783	1,959,310	2,046,483

Transportation Trends

With Particular Reference to the Intercoastal Trade

ROGER D. LAPHAM, president of the American-Hawaiian Steamship Company, made a very masterly address to six hundred traffic men gathered for the Steamship Night of the Pacific Traffic Association at San Francisco, August 13. His subject was "The trend of modern transportation with particular reference to the intercoastal situation."

After a sketchy review hitting the high spots of transportation development in the United States and describing the changes in methods and management as established by the public utility corporations ashore, Lapham applied the parallel to the intercoastal trade as follows:

"The 160 odd vessels now operating in the trade are owned, some by close corporations with few stockholders; some by corporations whose stock is much more widely held; and some by subsidiaries of very large corporations whose stock is very, very widely spread. It may be said that the majority of the vessels now operating are controlled by close corporations, and all these vessels compete with the larger transcontinental railroad systems, whose securities are held by thousands of stockholders.

The intercoastal lines are subject to control by the Shipping Board under the Shipping Acts of 1916 and 1920. Unfair and discriminatory practices are forbidden, but the lines are encouraged to maintain stabilized rates through the agency of conference relations, authorized by law because Congress believed they were beneficial to the shipping public.

Because the rapid growth of the trade has made the intercoastal services an essential and integral part of the country's transportation system, their owners must realize that shippers expect the trade to be conducted under the same broad policies governing the conduct of recognized public utilities—such as the railroads, the light and power companies, and the telephone companies. While there should be among the intercoastal lines the same urge to seek public good-will as evidenced during recent years by the railroads and public utilities companies, unfortunately this urge has not been manifested to the extent it should have been. Too often has the selfish viewpoint obscured the broader public viewpoint.

Looking at what is happening in every other business, it is fair to assume that time will dissipate the conflicting viewpoints represented in the intercoastal trade today. Accordingly, it is probable that fewer and stronger lines will emerge, and that such lines will be more willing to consider and better able to fulfill the needs of the shipping public than are the present intercoastal services. Just as other business is merging, so can we expect American shipping companies to follow the modern trend—witness the larger foreign lines, the Cunard, Royal Mail, Hamburg-American, North German Lloyd, the French Line, and the stronger Italian steamship units. Such stronger American companies will emerge with many stockholders, and will be operated, just as the railroads are now operated, by men born and brought up in the business.

The recent coastwise rate war was a typically unnecessary and foolish affair, belonging to an age that is past and having no place in the present order. Modern business demands more and more that cards be

played face up on the table. The public wants to know the facts of anything that affects it, and just as the Kellogg Treaty calls for positions openly taken and stated, so will public opinion demand that bigger business do likewise.

Let me repeat that times do change, and whatever the different aspects of these changes may be, they have all a common character and a common trend—away from the old individualistic order; away from the individual responsibility and independence—and toward mutual action, and public interdependence. The day is past for the man or the institution to play a lone hand on a large scale. Our social life and our economic structure are too ramified and complicated for that."

Shipping Board's Task

IN agriculture, mining, manufacturing, railroading, foreign trade, and business generally the United States has attained world preeminence. The main task of the Shipping Board now is to help American business men in their effort to duplicate this success in the field of shipping, following the policies of aid laid down in the shipping act of 1916 and the merchant marine acts of 1920 and 1928.

We have seen that the Shipping Board first built the greatest merchant fleet which has ever been constructed in so short a time. Then it developed the greatest network of ocean-going passenger and cargo liners which has ever been established in so short a period of years. Starting at the very bottom, it built up service and good will and developed traffic so rapidly that the newly established lines are already able, with the aid of our new laws, to hold their own in competition against the oldest and best established of their foreign rivals. And now the Shipping Board has shown itself to be just as energetic in effecting its voluntary retirement from the shipping field in favor of private American operators as it was energetic and successful in entering it during the confused period which followed the war, when private capital was as yet reluctant to make investments in ocean shipping.

When the Shipping Board was set up by the shipping act of September, 1916, its most important functions were to be, not Government operation, but the encouragement and development of a merchant marine and the regulation of carriers by water engaged in the foreign and interstate commerce of the United States. From these general responsibilities its attention has been largely drawn first to actual construction and then actual operation of vessels. With the sale of the United States Lines and other services, the Shipping Board is now in a position to give more attention to carrying out its original functions of aiding and regulating private shipping and, in general, promoting the ocean transportation that is essential for the foreign commerce of the United States.

(From speech by Hon. Sol. Bloom of New York in the House of Representatives.)

The California School Ship

ASSEMBLY Bill No. 253 became part of the California State Statutes in June. This bill provides an appropriation of $150,000 for the biennial period towards the maintenance of a California State School Ship for training merchant marine officers and provides also for a commission to manage this school as a part of the state department of education.

The commission is to consist of five men including the superintendent of public instruction who is to be ex-officio its executive head. The other four (three practical steamship men and one business man) are to be appointed by the governor. To date no appointments have been announced, although there is much talk of many candidates. There should be no political juggling with these appointments. No salary is provided for commissioners and there can hardly be even an expense account. It will take the strictest economy to operate within the budget. The commissioners will therefore need to be men of executive ability who, from the nature of their business or occupations, are naturally interested in the success of the school ship and can afford to give it the necessary time and attention without direct compensation.

We would therefore suggest that this commission should be so constituted as to represent the American shipowners of California and that this can best be accomplished through the advice of the Pacific American Steamship Association and the Shipowners' Association of the Pacific Coast. We would suggest also that, insofar as it is practical, the commission should represent all of California.

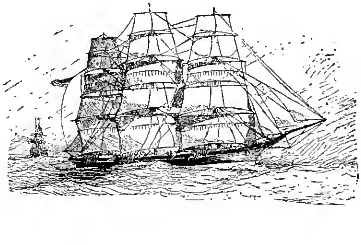
American shipowners of California should be fully represented because of these facts:

(1) The training given on this school ship will be for the purpose of training California boys in preparation for work as officers in the American merchant marine and they will, on graduation, be looking for placement on the American merchant vessels owned in and operated out of California ports. Therefore the school ship and its system of training should be correlated as closely as possible with the practical operation of those vessels.

(2) The school ship will be visiting many ports around the Pacific Ocean and will be requiring many and various services at those ports. A close tie up with the shipowners will bring to the ship on such visits in foreign ports the free use of many facilities which might otherwise be unavailable and will save much trouble and expense in the operation of the vessel.

(3) The appropriation is small enough under present costs; so that only the most intelligent economy will enable anything like a worthy program to be maintained; and the shipowner is the only class available for this commission that has had any experience in practicing operating economy afloat.

Governor Young should use great care in selecting the members of this commission and should seek the advice of old experienced California shipowners who are developing the far flung trade routes of California ports and to whose ships the graduates of this nautical school will naturally come for their life work.



Geared Turbiner Humuula

Union Plant, Bethlehem Shipbuilding Corporation Delivers Another Fine Passenger and Cargo Steamer to the Inter-Island Steam Navigation Company

ONCE more the Inter-Island Steam Navigation Company of Honolulu has taken a new Bethlehem-built steamer out of the Golden Gate for service in Hawaiian waters. This vessel is equipped with Babcock & Wilcox water-tube boilers supplying steam to Westinghouse geared turbines of the same type fitted into the Waialeale and the Hualalai. The new craft is named Humuula, which is the Hawaiian name for a certain hard red stone from which the islanders formerly fashioned axes and other edged tools.

The Humuula has an over-all length of 218 feet 3 inches, a length between perpendiculars of 210 feet 9 inches, a molded beam of 38 feet, a depth molded to main deck of 17 feet, a loaded draft of 14 feet, and a deadweight capacity of about 800 tons; with cabin accommodations for 36 passengers.

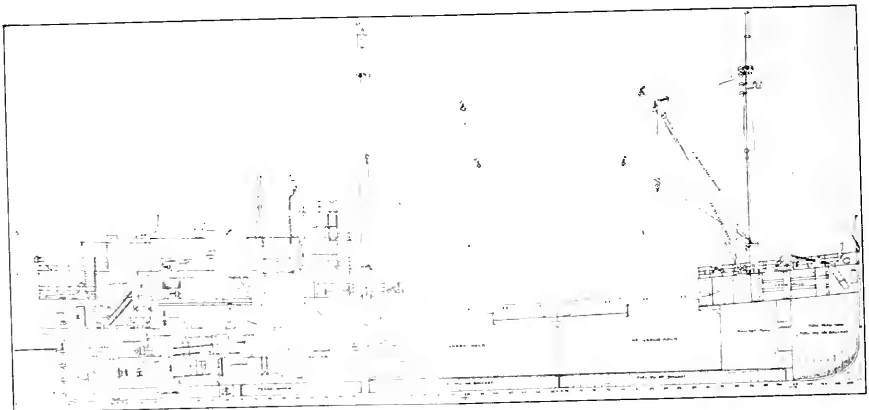
As will be noted on the inboard profile herewith, the hull below the main deck is divided into six water-tight compartments by five water-tight bulkheads. These compartments, from bow to stern, comprise the forepeak tank arranged for liquid ballast or fuel oil, the deep ballast tank and chain locker, No. 1 cargo hold, No. 2 cargo hold, boiler and engine rooms, and the after peak tank arranged for fresh water storage.

The crew's quarters are arranged in the forecastle on the main deck. Engineers are quartered on the main deck on the starboard side of the engine room casing, with the galley and crew's mess on the port side. Aft of the engine room casing is the dining saloon with comfortable seating for 28. Steward, cooks, and waiters are housed aft of the dining saloon. Passenger accommodations are arranged on the poop and shade decks aft.

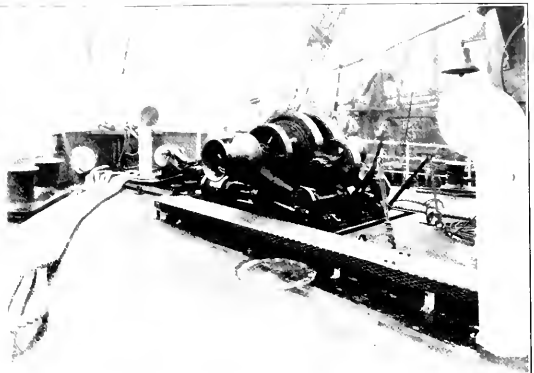
The Humuula is a single-screw vessel and is propelled by a Westinghouse geared turbine unit that is practically a duplicate of those used on each side of the twin screw installations on the Waialeale and the Hualalai. These two vessels have been phenomenally successful—therefore this third order. The new method of gear cutting and new turbine design perfected by Westinghouse at South Philadelphia have resulted in a machinery installation on these three vessels that is practically free from noise and vibration.

This installation, designed and built by the Westinghouse Electric & Manufacturing Company, comprises a Westinghouse combined impulse reaction type, complete-expansion turbine mounted on top of a Westinghouse 2-pass type, surface condenser and driving the propeller shaft through Westinghouse double reduction gearing. This turbine develops 2000 horsepower at 3600 revolutions a minute turbine speed with steam at 265 pounds gauge pressure, 75 degrees Fahrenheit superheat and $28\frac{1}{2}$-inch vacuum. Under these conditions the turbine drives the propeller shaft at 120 revolutions a minute, corresponding to a ship speed of a little better than 13 knots. (A complete description of the arrangement of nozzles and of the turbine design will be found in the article on the steamship Hualalai published in the July 1929 issue of Pacific Marine Review.) Two Westinghouse 35-kilowatt turbo-generating sets furnish electricity for lighting and electric auxiliary power.

Steam for this plant is supplied by two Babcock & Wilcox marine water-tube boilers with superimposed superheaters. Each boiler has 3067 square feet of heating surface and is built for service pressure of 280 pounds. They are equipped for oil-burning with Babcock & Wilcox Cuyama-type mechanical atomization burners, arranged for either natural or assisted draft. Each boiler is served by an electric motor-driven blower built by Western Blower Company of Seattle, and is equipped



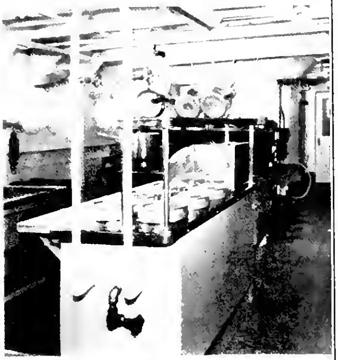
Inboard profile of the geared turbine, single screw, steamer Humuula.

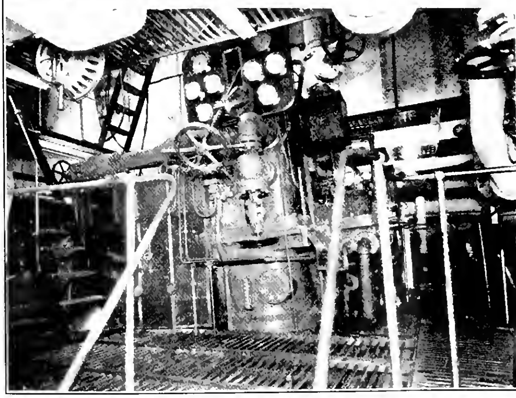


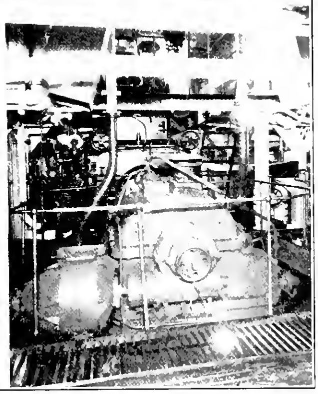
INTER ISLAND STEAM NAVIGATION CO. LTD.

S. S. HUMUULA

Some pictured details of another fine Bethlehem job







Upper left, pilot house showing Rich smoke detection cabinet and Derby fire alarm indicator. Upper right, forecastle deck featuring the Bethlehem Steel winches. Center left and right, two views in the galley featuring Ray oil burning range and lavish use of Monel metal. Lower, two views in the engine room showing the Westinghouse combined impulse reaction turbine with double reduction gears.

with Diamond Power Specialty Company Model G-2 marine type soot blowers.

Warren reciprocating pumps, supplied by the Western Engineering Company of San Francisco, are used for such important engine room services as main boiler feed, fire and bilge, fuel oil transfer and firing, sanitary and fresh water, and lubricating service.

Western Engineering Company supplied also the Davis Engineering Company's Paracoil type feed water heaters and Luboil coolers, the Diamond soot blowers mentioned above, and the Kingsbury thrust bearings for the main turbine drive. This firm manufactured and installed the Vortex type Hickman air separator which is installed in the main feed line adjacent to the feed water heater. This separator protects boiler tubes, piping, and condenser tubes against corrosion.

A De Laval oil purifier insures clean lubricating oil for turbines and gears. Cory engine room telegraph and Sperry revolutions indicator connect engine room and bridge. Ranarex carbon dioxide indicators and Tycos stack temperature indicators enable the engineer to keep check on combustion conditions.

The windlass, capstans, and steering engine are of Bethlehem Shipbuilding Corporation make, steam drive, and of ample capacity for the job.

Very generous cargo handling equipment is provided, comprising one 5-ton and four 2-ton steel cargo booms served by four 8- by 8-inch double cylinder steam cargo winches of the well known speedy quiet running Allan Cunningham make that has become so popular for passenger vessels. These winches were supplied by the Western Engineering Company of San Francisco.

Weule compasses and a Weule electric sounding machine are installed in the pilot house and bridge. Hough and Egbert of San Francisco supplied a Lux fire extinguishing system, protecting the engine and boiler rooms. A Rich smoke detection installation protecting spaces below main deck, and a Derby fire alarm system protects passenger accommodations.

The galley is quite remarkable for a ship of this size. It serves also as pantry and its fixed furniture is elaborately faced with Monel Metal, which, combined with the red tile floor and white bulkheads and ceiling, gives a very pleasing appearance. The range is from the W. S. Ray Mfg. Co. of San Francisco, and is equipped with the famous Ray rotary oil burner. The Dohrmann Hotel Supply Company of San Francisco arranged and outfitted this galley and furnished the usual electric egg boilers, toasters, etc.

A Frick refrigerating unit takes care of cold storage for galley stores and refrigerated cargo and supplies cold drinking water.

The draperies and much of the furnishings are from Bernard, Inc., San Francisco. The Simmons Company supplied the beds. Hill, Hubbell Company furnished red lead, Bitumastic, and Linatol floor covering. The American Paint Company's bottom paint was used on the hull. On exposed steel decks Thorkote covering protects the metal.

The Humuula carries three surf boats and a motor launch, all of which were built by George Kneass & Sons of San Francisco.

On her trials, the Humuula made 13 knots easily, and has considerable reserve power for spurts if necessary.

From Pacific Marine Review, September 1904

Ira A. Campbell has returned from a professional visit to San Francisco and will resume charge of "our legal log."

The steamer Minnesota is expected to reach this coast about November 20.

Nine new wooden steamers built by Pacific Coast shipyards were listed:

Cabrillo. Built by Muller at San Pedro, with machinery by United Engineering Works of San Francisco and Oakland for Wilmington Transportation Company.

F. A. Kilbourne. Built by Bendixen Yards, Eureka, with machinery by Fulton Iron Works, San Francisco, for Watsonville Transportation Co., overnight service between Watsonville landing and San Francisco with fruits, berries, and vegetables.

Arabs. Tugboat built by Fulton Iron Works for Pacific Mail Steamship Company.

Fernwood. Key System ferry built by John Dickie, Oakland, with machinery by Sullivan of New York.

Norwood. Built by Hall Bros. at Winslow, Washington, for Sudden & Christensen.

Northland. Built by Bendixen at Eureka with machinery by the Fulton Iron Works, for E. J. Dodge of San Francisco.

Vanguard. Built by Bendixen, with machinery by Fulton, for E. J. Dodge.

Cascade. Built by Bendixen, with machinery by Fulton, for Charles R. McCormick of San Francisco.

Robert Dollar. Built by Bendixen, with machinery by Risdon Iron Works, San Francisco, for the Robert Dollar Company.

An interesting fact anent these nine vessels is that seven of the nine were equipped with Babcock & Wilcox water-tube boilers.

The Kobenhaben

THE Danish training ship Kobenhaben, long overdue and practically given up, adds another to the long list of sea mysteries, and our hearts go out in sympathy to the families and friends of her officers, crew, and cadets and to the East Asiatic Company, owners of the vessel.

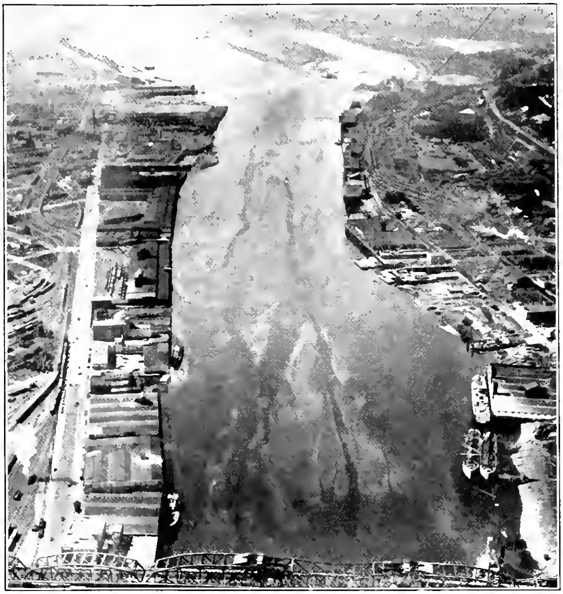
This vessel was built by Ramage and Ferguson of Leith, Scotland, in 1921, designed especially for worldwide tramp service in the training of cadets for officers in the Danish merchant marine. Her steel hull was built to Lloyd's special survey 100-A-1 and she was rigged as a five-masted bark and equipped with an auxiliary Burmeister & Wain, 4-cylinder, 600-brake horsepower engine driving a special propeller. She was the largest and one of the most modern training ships afloat, designed and equipped especially for that purpose.

Portland Gets Deep Channel to Sea

Thirty-Five Foot Columbia River Waterway Finally Approved After 50 Year Fight

By Chas. F. A. Mann.

CULMINATING more than a half century of incessant work by the city and port of Portland, Oregon, comes the announcement of Major - General Edgar Jadwin, chief of the United States Army Engineers, that his department has formally approved the bill introduced in the last session of Congress calling for the permanent enlargement of the existing 100-mile channel from Portland to the sea to a depth of 35 feet and a width of 500 to 600 feet. This long-awaited decision virtually means that the final improvement of the Columbia Channel will soon be under way, and that Portland will be on a parity with other Northwest ports and accessible to practically every ship that sails on the Pacific.



Aerial view of the northern portion of Portland's waterfront on the Willamette River. In the upper center may be seen the straightening of the channel and the municipal airport on Swan Island.

No more fascinating piece of engineering than taming the eccentric Columbia river has ever been carried on anywhere in the world. Beginning in 1878, work toward making the channel permanently navigable to deep water craft was begun, followed by the construction of the famous jetties at the mouth near Astoria and the building of wing jetties to narrow the river and speed its flow in order that the heavy silt would be carried out to sea. Some of the most brilliant harbor work ever done has been completed by the Port of Portland Commission, whose task it is to maintain the Portland Harbor and care for the Willamette River to its union with the Columbia, below Vancouver, Washington, and establish a deep water harbor system on the shallow Willamette, all 100 miles from tidewater. Four of the largest hydraulic dredges in the world, including the giant Clackamas, with 3400 horsepower diesel-electric drive, have been designed and built by Portland engineers to create and maintain this fine harbor and for the construction of one of the finest airports on the Pacific Coast—the Swan Island airport, largely made from the discharge of the dredges.

The bill as approved by General Jadwin calls for an initial expenditure of $1,366,000 and an annual appropriation of about $665,000 for maintenance. and use by the Army Engineers of the four dredges belonging to the Port of Portland Commission for at least six months of the year, with no cost to the government except actual operating expenses. Under the terms of this act, the Port Commission must maintain the minimum depth of the Willamette from the Inner harbor to its junction with the Columbia.

With a channel 35 feet deep and 500-600 feet wide, a tremendous gain in river shipping is more than probable, and plans are already afoot for extensive additions to the existing terminal facilities. Bids were opened for the construction of $30,000 work of improvements to Portland's Municipal Terminal No. 4, and the July movements of cargo in the Columbia River district exceed all previous records. Approximately 7,000,000 tons per year move out of the Columbia. The second consignment of silk to arrive in Portland came when the Rhine Maru landed August 7 with a $3,500,000 cargo of raw silk bound for the Atlantic Seaboard.

Portland is again attracting notice as a shipbuilding center. One of the busiest yards on the Pacific Coast is the big plant of the Albina Marine Iron Works. At the present time three lightships are building for the government at a total contract price of $552,616, the first one being ready for delivery around September 15.

The big dredge Clackamas is busily engaged in removing a sandbar near the mouth of the Willamette River, while the Port of Vancouver, Washington, is deepening the channel to 30 feet. Two great bridges are now being built across the Willamette and the Columbia, one at Portland and the other at Longview, involving cost of over $9,000,000. These great structures rise over 200 feet above the river. And no end seems yet in sight for the rapid gain in commerce or physical improvement on this great inland waterway.

Three Notable Passenger Liners

The Bremen, The Asama Maru, and The Britannic

THE shipyards of the world are turning out some magnificent passenger liners this year. Three are focusing public attention. First, the Bremen, with her capture of the Atlantic speed record so long held by the Mauretania; second, the Asama Maru, largest motorship and largest passenger liner yet built in Asia; third, the Britannia, largest motorship built in Great Britain.

A short account of these three ships follows:

THE BREMEN

On July 22 the new North German Lloyd passenger liner Bremen entered New York harbor on her maiden voyage, 4 days, 17 hours, 42 minutes from Cherbourgh, thereby establishing a new record for transatlantic passages. The best previous time (5 days, 2 hours, 34 minutes) was set up in 1927 by the steamship Mauretania, 22 year old Cunarder. The average hourly speed for the Bremen's run was 27.83 knots, the average for the last 24 hours was 29.6 knots; so that it is very evident the Bremen's machinery was not pushed anywhere near its limit in making the record. In fact, many marine experts expect to see this vessel hang up an average of 30 knots or better for the entire crossing.

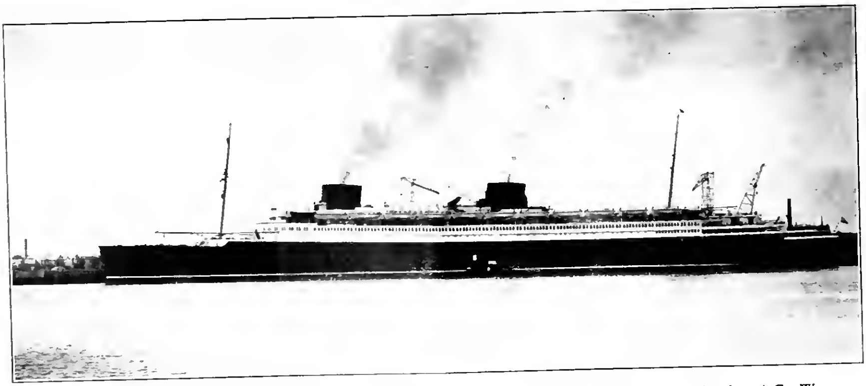
With her twin sister, the Europa, this new transatlantic blue ribbon holder represents the highest development to date in naval architecture, in marine engineering, and in passenger comfort. According to figures published by the North German Lloyd, her principal characteristics are:

Length over-all, 938 feet.
Beam, 98 feet.
Depth, main deck amidships, 54 ft.
Draft, 32 feet.
Displacement at draft, tons 49,200
Normal horsepower, 100,000.
Normal speed, knots, 27.
Overload trial horsepower, 130,000
Corresponding speed, knots, 29.
Daily fuel at 28 knots, tons 830.
Steam pressure, pounds, 330.
Steam temperature, total, degrees F. 700.
Number of screws, 4.

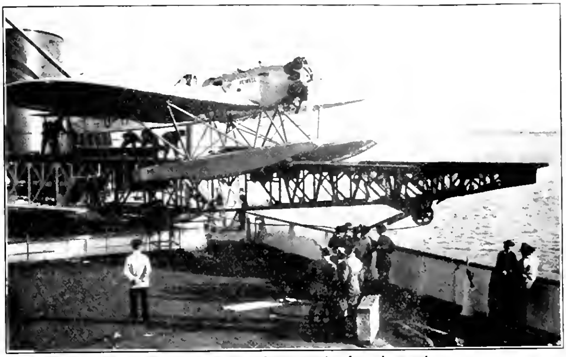
Bremen's machinery was designed and built under the supervision of the great German expert on turbine design, Dr. Bauer; and Dr. Hein was responsible for her hull design. In a talk at a New York luncheon given in his honor just after the arrival of the Bremen, Dr. Bauer said, "I am convinced that no other arrangement could be adopted than that of the four-shaft turbine drive with single reduction gearing and oil-fired water-tube boilers with comparatively high steam pressure and high superheat. The chief principle followed was to combine light weights with the greatest strength of all parts."

As developed the propulsion plant consists of four independent sets of triple expansion, single reduction gear turbines. The high pressure turbine is mounted astraddle of the intermediate and low pressure, and each stage operates through its own pinion. For normal power, the turbines operate at 1800 revolutions a minute and the propellers at 180. The propellers are four bladed, 5 meters diameter and pitch, and 11 square meters area. Steam is supplied by 20 water-tube boilers of the German naval type; eleven are double-ended and nine single-ended. These boilers are in two groups widely separated. Extraordinary care is taken to insulate against heat losses. The auxiliary power plant includes four 560-kilowatt diesel engine driven generating sets.

The passenger accommodations of these two new German ships are in a class by themselves; and the Bremen has been given a special new rating as Class A by the North Atlantic Conference. Her glass enclosed promenade deck, 20 feet wide on each side, runs practically the entire length of the superstructure, and the boat deck gives a full width sweep for deck sports. The boats



North German Lloyd liner Bremen, ready to be delivered at her builders, the Deutchse Schiff u. Maschinenbau A.G., Weser, the fastest passenger liner afloat.



The catapult for sea planes mounted between the funnels on the superstructure of the Bremen.

are carried, each on its own davits, at a height which permits walking under their keels, giving an open promenade from rail to rail.

Provision is made for 2200 class passengers, divided as follows: 800 first, 300 second, 500 tourist, 600 third. The crew numbers 950. In the first class there are 180 bedrooms with private bath and 100 bedrooms with private showers. All staterooms in all classes are fitted with porcelain washstands and running hot and cold water.

An entire deck, E, is used for dining rooms for the various classes and galleys are located on F deck immediately below. The first class dining room seats over 600 at small tables. The first class lounge is 60 feet by 135 feet.

In short, the Bremen is not only the fastest but the most modernly equipped passenger liner afloat today, and her machinery is so well balanced, her hull so well designed, that the speed and the completeness of equipment are maintained quietly and without vibration.

THE ASAMA MARU

On October 5 next, the Asama Maru will clear from Nagasaki for San Francisco, arriving about October 25. On her builder's trials on August 10 she is said to have made a speed of 21 knots. As the largest vessel yet built in Japan, she has excited considerable interest in marine circles. Her principal dimensions are:

Length between perpendiculars, 560'0".
Beam molded, 72'0".
Depth molded, 42'6".
Gross tonnage, 16,500.
Sea speed, knots, 19.
Engine power, brake horsepower, 15,500.

The main power plant consists of four 8-cylinder, Sulzer marine type, 2-cycle, single-acting engines. Cylinders are 680 millimeters bore, with piston stroke of 1000 millimeters. Scavenging air is supplied from three electrically driven blowers. Each of these engines is directly connected to one of the four propeller shafts, and each develops 3875 brake horsepower at 115 to 120 revolutions a minute. The fuel oil capacity is about 3100 tons; and it is estimated that the daily consumption at 17½ knots speed needed for the scheduled run will be about 65 tons.

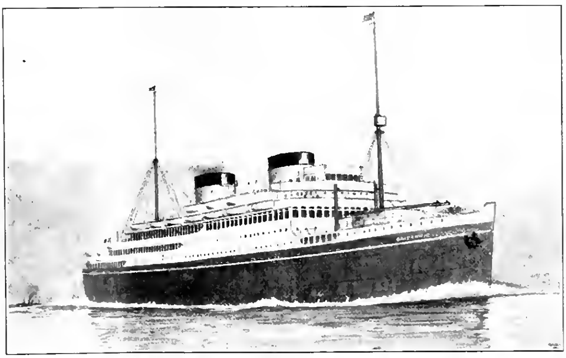
Engines for the Asama Maru were built in Winterthur, Switzerland, and shipped to Japan to be erected by Mitsubishi Yosen Kaisha at Nagasaki. The Japanese firm built a similar set for the Atsuta Maru, a sister vessel to be finished shortly. Chichibu Maru, another sister, is building at the Yokohama Dockyard and is to be powered with twin screw Burmeister & Wain double-acting diesels.

THE BRITANNIC

On the third of August the motorship Britannic was launched from the Harland & Wolff Yards at Belfast for the New York-Liverpool service of the White Star Line. She is 680 feet long, 82 feet beam, molded; 43 feet 9 inches depth molded; and of 27,840 gross tonnage.

The Britannic will be equipped and outfitted with every modern convenience for the comfort of the traveling public. Her power plant will consist of two Harland & Wolff B. & W. double-acting, 4-cycle, directly reversible engines, with ten 840-milimeter-bore cylinders and a piston stroke of 1500 milimeters. Independent diesel compressor sets provide injection and maneuvering air. Each propulsion engine develops 10,000 brake horsepower, and they are figured to give the vessel a sea speed of 17 knots. Four diesel driven generating sets having a combined capacity of 2000 kilowatts will provide auxiliary power and lights.

The Britannic will be the largest British motorship and the largest liner on the New York-Liverpool run.



The White Star motor passenger liner Britannic as she will appear when completed, from a sketch made expressly for Pacific Marine Review by R. C. W. Courtney.

Terminal Economy and Cargo Management

Are the Facilities of Our Pacific Coast Ports Adequate From a Steamship Executive's Viewpoint?

By A. F. Haines, Vice-President, American Mail Line, Seattle.*

THE subject, "Are the facilities of our Pacific Coast ports adequate from a steamship executive's viewpoint," is as long as the shore line of the Pacific Coast and it would be necessary to spend much time and study of the various ports and their facilities before it would be possible to paint a picture of much value. In the time allotted, only a few generalities can be set forth.

Economy of operation is one of the first considerations of the steamship owner. Terminal and handling charges amount to from 20 to 25 per cent. of the total freight revenue received. Therefore, the steamship owner is vitally interested in terminal facilities. The better your docks are constructed and the more up-to-date and efficient equipment that is provided for the movement of cargo, the more shipping will be created and attracted to the port.

While our port facilities may possibly be adequate for today's business, they are certainly not adequate for the future. The volume of business at our Pacific ports is rapidly increasing, and the port facilities must keep pace. The port that does not provide ample, adequate, up-to-date facilities will rapidly fall behind.

Bulk Cargoes

It is only a few years ago that the first ton of bulk wheat was shipped from the Pacific Coast; but now it is necessary to have large bulk grain elevators at many of our ports for this trade. It was the intercoastal steamers, requiring rapid turn-around, that forced the mills to stack lumber in sling loads instead of forcing the vessels to handle the lumber piece by piece on the wharf and then drag it from 100 to 200 feet with the ship's gear. These are merely samples of the innumerable changes and improvements in handling methods that have already come about, and many more are badly needed.

Every port on the Pacific Coast from Vancouver to San Diego will shortly require additional and more modern terminal facilities. Ample berthing space for the ever increasing number of vessels is important in order to avoid delay to the steamers. More cranes for loading and discharging must be added at various ports. Mechanical carriers for moving cargo to and from ship's tackle and to and from cars and trucks should be carefully planned for the sake of economy and speed. More conveyors, wharf elevators, additional railway track facilities, both depressed and surface tracks, are all necessary. Fuel oil pipe lines must be laid under the piers to ship side so that bunkering may be accomplished while loading and discharging, in order to save time and expense of shifting.

Cargo oil in bulk is a growing trade, and liner service requires oil tanks adjacent to or underneath the discharging berths, so that oil can be pumped direct from the steamer into these tanks.

Warehouses should have concrete floors, not only for durability, but for the smooth and easy handling of cargo. The warehouses must be provided with charging stations for electric trucks and with fully equipped garages for the gasoline trucks. Additional cold storage space is required at several ports on the Pacific to take care of the rapidly growing trade to the Orient, Europe, and South America.

Passenger facilities must not be overlooked. Our ports have a growing water passenger traffic; but heretofore little or no attention has been paid to the handling of passengers at terminals. They are required to weave their way through piles of cargo and get aboard the best way they can. The day of the single deck warehouse for deep water business has about passed; all new constructions should be of two floors, with ample passenger facilities on the second floor; but also with sufficient carrying capacity for cargo. All modern steamers can land cargo directly into the second floor. Cargo can be loaded to cars or trucks from the second floor by gravity or by elevators, thus lessening the cost per ton through the terminal. The large steamship organizations in the Pacific trade are today building and planning for the construction of large, fast, modern steamers with finer accommodations for passengers and better equipment for the handling of cargo. Our Pacific trade is still in its infancy; and it is necessary that our port facilities keep pace. The port that is a little in advance in the way of terminal facilities will certainly draw the trade from those ports having poorer facilities.

Industrial Terminals

Industrial and private terminals are one of the curses of steamship owners, as they require many shifts, costing much in time and money. Our industries seem to prefer the waterfront where the price of land is high and where the expense of building docks and warehouses is heavy, the cost of operation and depreciation great. If these industries would use interior land at less value, less taxes, less cost of operation, less depreciation, and permit the legitimate dock owners and dock operators to handle the cargo to and from the steamers, it seems to me they would be better off, and certainly the transportation lines would. The expense and delay of shifting the steamers from dock to dock, discharging and gathering up small lots of cargo, adds considerable to the rate of freight that must be paid. The public terminals should keep their terminal charges low and should provide every facility for economical and rapid handling in order to discourage every Tom, Dick, and Harry from operating his own dock. An ideal steamship company is one operating from a single port to a single port. Every additional port at either end adds to the expense, but the perfect steamship operation is from one terminal in one port to one terminal in another port. This means minimum freight rates. Therefore always keep in mind that the proper terminal is the one providing the facilities for handling 100 per cent of a steamship line's business.

Individual Ports

Time does not permit analyzing the facilities of each port up and down the coast. The various ports have their various problems, and each should study the na-

*Paper read before the Association of Pacific and Far East Ports, Tacoma, July 12, 1929

ture and requirements for the flow of cargo through that port. The problems are not common. Pacific ports north of San Francisco are seriously interested in the facilities for loading lumber, while the ports San Francisco and south are interested in the facilities for discharging lumber—two different problems.

San Diego has its cotton and fruit. These require facilities that would be useless at the northern ports.

Port Los Angeles has had phenomenal increase in its commerce due principally to the harbor and terminal development which had to come before the ships, but even now the terminal facilities are taxed to capacity.

San Francisco, Oakland, and other **Bay Ports** must have additional and up-to-date terminal facilities to take care of their fast growing water business. Oakland has been handicapped by shoals along the waterfront. Dredging has resulted in the construction of new, modern piers. Oakland's water-borne commerce has increased by leaps and bounds, due to its location on rail lines and its large land area. Many new industries and manufactories are being attracted, and additional terminal facilities must be provided.

Astoria is a good example of the fact that good terminal facilities attract shipping. Her export of lumber, flour, wheat, and canned salmon has been greatly increased due to the erection of three good terminals.

At **Portland** wheat shipping is the principal commodity, followed by flour and lumber. The growth of the commerce of this city, like our other northwestern ports, depends upon the establishment of more industries and manufacturing to support shipping. Additional terminal facilities now contemplated will undoubtedly keep pace with the growing water commerce. The terminals of this port must give great consideration to the draft of water, not only alongside the terminals, but in the channel to and from the sea.

Grays Harbor will in the future be a large port. Extensive dredging programs are being carried out; but the steamship operator is interested in the depth of water alongside the wharves and terminals as well as under the pier. More dredging is required, more aids to navigation, and a better general cargo terminal. The Hammermill Paper Company is completing a $6,000,000 plant at Hoquiam. There will be many other industries added. Therefore, terminal facilities should here as in other ports be built for the future and not for the present. They should be substantial and modern—not makeshifts.

Puget Sound ports are numerous, and it would take hours to properly analyze their port facilities, and this will not be attempted here. Washington ports require a large, modern, dry-dock capable of taking the largest vessels. Seattle requires a belt line and a uniform switching charge, and an improved, paved embarcadero throughout the waterfront.

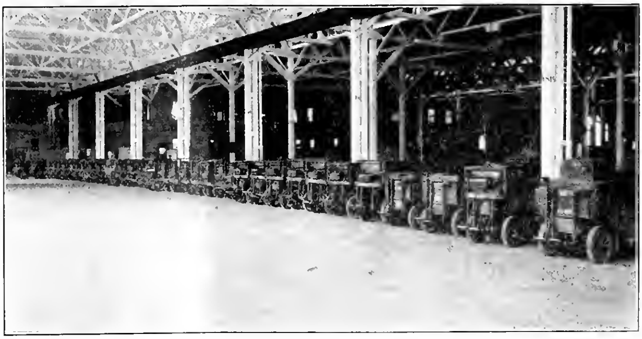
Olympia, Port Angeles, Port Townsend, Everett, Bellingham, and **Anacortes** are all rapidly growing ports that will require improved, extended, and modernized terminal facilities.

Tacoma is a rapidly growing port of the first class. The terminal facilities may be adequate for the present, but not for the future. A consolidation of her terminal facilities would be a great advantage to shipping. Here is a good example of the need for a large, well equipped, centrally located combination passenger and cargo terminal, with all the facilities that go with it to take care of any steamship line's entire business, such as lumber, flour and general cargo, bulk cargo oil, fuel oil, cold storage, and mechanical handling.

Vancouver and **Victoria** are examples of the advantages of keeping the terminals well in advance of the volume of business. Over 97,000,000 bushels of grain were shipped through Vancouver in 1928, due to the provision of adequate storage and terminal facilities, up-to-date mechanical loading equipment, and modern appliances. Victoria's terminal facilities are well in advance of actual requirements today, but they will attract business to the port and will not be regretted in the future.

Trucks and Teams

It was not my intention to get quite so far into detail, but there is one more item that should be mentioned—it is a disgrace that a valuable waterfront steamship terminal should dedicate one-third of its warehouse space as a public road. Go to any busy dock in one of our large ports and see the needed floor space jammed with motor trucks and horses. One man is kept shoveling up the horse manure, but the urine trickles under bags of sugar and the boxes of tea. There is a great deal of damage and theft due to teams and trucks in the warehouse, the congestion is something frightful, and the labor lifting to and from the tail gates is enormous. You will frequently see a 5-ton truck drawn by two and sometimes three horses, or a motor truck as large as a boxcar sitting idly in the midst of the cargo waiting 15, 30, or 45 minutes to deliver or receive one



Line-up of electric storage battery trucks on the Matson pier, San Francisco. Seventy-two electric trucks, nearly all of one make, handle the increasing volume of cargoes moving over the Matson piers to and from Hawaii, the Philippines, and Australasia. This progressive firm finds hand trucks obsolete where speed and economy are required.

small package. The added cost of handling the cargo through the warehouse under such conditions, plus the interest and depreciation on the investment in the roadway, plus the damage and theft, will amount to a good many cents per ton for every ton that goes over the terminal.

No modern warehouse should permit or require trucks or teams inside the warehouse doors. If the terminal is properly built it will cost less to receive and deliver the team and truck cargo at either the end or the side of the warehouse.

Conclusion

In closing let me say that on the whole we are proud of our Pacific Coast port terminal facilities. They are far ahead of the Atlantic seaboard terminals. They are generally satisfactory and attractive to the steamship operator. The facilities of many ports in foreign countries are far ahead of us, and you men are responsible for the upbuilding of our waterborne commerce, and it is this waterborne commerce upon which the prosperity of the ports depend.

Comparison Between Leases, Preferential Assignments, and Direct Operations of Port Terminal Properties

By Philip H. Carroll, Executive Secretary,*
Commission of Public Docks, Portland, Oregon.

IN looking through the port glossary of the American Association of Port Authorities, the following definitions are found:

Lease: "An agreement between parties for the possession, control, and exclusive use of certain facilities or properties during a certain time, for a rent or price which one party obligates himself to pay to another."

Irrespective of the compensatory clauses, a lease removes the control of the terminal property from the hands of the owner for a definite period of time, thus affording the operator under lease practically all the advantages of ownership.

On the other hand, with the increasing waterborne tonnage at many of our ports, suitable terminal facilities are not always available to the operator seeking a lease and therefore he may frequently be obliged to accept a pier or wharf unmodern in construction, physically deteriorated, and possibly situated in a not too strategic location. In order to secure a terminal on a lease basis with its attendant freedom of action and its longer and more certain period of occupancy the operator may frequently overlook many disadvantages feeling that the privileges gained more than compensate for the inconveniences entailed.

Preferential Assignment: "An option, first choice, or preference to steamship lines, agents or other users, for the use of a definite reservation or berth space at a wharf or pier, or cargo space on wharves or in sheds or warehouses."

Under this arrangement whether the owner of the wharf be the public or an individual, the operation of the property is in the hands of the assignee; the steamship company or its agent. Under preferential assignment, vessels are assured of berthage privileges at the same pier, which greatly facilitates assembling of cargo for shipment and the delivery of same to consignees.

From the dock operator's standpoint, the receiving and delivering of cargo, handling, car loading and unloading, checking, storage, reconditioning, and all other operative phases are similar to those obtaining under a lease arrangement, but within certain limits. Under a preferential assignment the wharf operator must maintain his dock force, must account to the assignor for cargo handled, must pay certain charges, must berth, load, and discharge vessels other than his own or those of his principals—however, he has no invested capital in terminals. On the one hand the assignor retains a well defined control over the property under preferential assignment without, however, interfering with the cargo movement or the relations between ship, dock operator, and shipper. On the other hand, the assignee has an opportunity to make a profit on many of the operations performed under a preferential assignment arrangement in addition to any economies he may effect through operating efficiency.

Direct Operation: I find no definition in the glossary covering direct operation, but for the purpose of this paper I will consider it as meaning the performance of all services and operations on the wharf by the owners, either a public or a private dock operating organization, for the account of the various steamship lines, shippers, and consignees using the terminal in question.

In addition to the above mentioned classification of dock operation we have, under The Commission of Public Docks in Portland, still another arrangement by which the steamship company has practically a preferential assignment without any special consideration and performs all dock operations with the exception of car loading and unloading. Under this arrangement of direct operation all services are performed by the wharf operator and the vessel merely pays such charges as the tariff specifies are to be levied against the carrier. The shipper and/or consignee pay the balance of the expense incurred in the terminal operation.

From the standpoint of the ship, direct operation is an excellent arrangement where the steamer calls infrequently, as under this procedure the cost of the dock force and all other terminal expense is shouldered by the dock operator and charged to the ship only as used. Thus the steamship line making infrequent calls is better off under this arrangement.

On the other hand, the steamship company making frequent calls fares in the opposite manner as it is obliged to pay out to the wharf operator for his services the charges provided for in the tariff without being able to make a profit for themselves therefrom, and without having complete control of the terminal

*Paper read before the Association of Pacific and Far East Ports, Tacoma, July 20, 1929.

operations, which is so desirable to the steamship and affords many opportunities for efficient management and savings impossible under direct operation of terminal facilities through a wharf operator.

Conclusion

The President has frequently expressed himself as favoring private enterprise and the keeping of a goverment out of business, and from my own limited personal experience I cannot but concur in his view. Personally, I feel that for a port the best policy to follow is for the public to use its credit and low interest rate to build a system of wharves with public moneys. This will insure a uniform plan of port development, standardization of wharves and equipment, and give the governing body of the port control of all its facilities.

When it comes to operating these facilities, however, it seems to me that they should be turned over to responsible steamship lines or wharf operators on a preferential assignment basis. The operator should offer sufficient tonnage and guarantees over a period of time to justify the transaction and the returns should be sufficient to insure a fair return on the investment. Under such a scheme the operator of the dock would have the fullest possible freedom, would be able to secure high class facilities without an investment therein, and in addition he would not run into competition with publicly operated taxfree facilities. Such a scheme on the other hand, would give the public all necessary control of terminal facilities within the port, and this without the necessity of legislation or the possible placing of the terminals under such bodies as the Interstate Commerce Commission, the Shipping Board, or other government agency. The public further, in addition to furnishing adequate and modern terminal facilities, would be able to insure a maximum adherence to a uniform system of terminal charges which in itself would be a tremendous asset to the port by automatically eliminating profitless rate cutting on the part of competing terminals.

A policy of publicly owned but privately operated wharves on preferential assignment basis appears to me as the best means of developing a port in a manner satisfactory and fair to the public interest and agreeable to the steamship operators and the shippers.


The terminals at Smith Cove, Seattle. These are said to be among the largest commercial terminals in the world.

Pacific Maritime Safety Code

By F. C. Gregory, Safety Engineer,
United States Employees' Compensation Commission, Washington, D.C.

ON Friday, August 2, a meeting was held in the conference rooms of the Marine Service Bureau at San Francisco, which was the successful termination of a very important phase of the organized accident prevention work of the Pacific Coast. This was the conference of the Pacific Coast Maritime Safety Code Committee, called to formally consider the adoption of a uniform safety code for stevedoring operations on shipboard.

For organization purposes, the coast had been divided on geographical lines into districts comprising the State of Washington, except Columbia River ports, the Columbia River and Oregon coast, San Francisco Bay, and the ports of Los Angeles and San Diego. Existing trade and labor associations had formed district code committees which had considered the proposed code and sent instructed representatives to the conference. Captain J. C. Dolbeck of the Waterfront Employers of Seattle and J. C. Bjorklund, district secretary of the International Longshoremen's Association, Tacoma, represented the Washington district, H. Y. Delanti of Aberdeen, the third delegate, being represented by proxy. For the Columbia River district, J. B. Gilkey, of the Portland Stevedoring Co., E. C. Hamilton, of Brady & Hamilton, Inc., were in attendance, Mr. Hamilton voting the proxy of Captain Paul McDonald, the third member. Captain F. M. Edwards of the Matson Navigation Company, A. E. Stow of the American-Hawaiian Steamship Company, and J. B. Bryan, president of the San Francisco Longshoremen's Association, were the San Francisco representatives. T. H. Germain of the Pacific Steamship Company, Thomas James, Banning & Co., and C. G. Limecooley, of Freeman & Co., were the Los Angeles district delegates. William A. Marshall of

Seattle and Warren H. Pillsbury of San Francisco, deputy commissioners for the Federal Compensation Commission, and Byron O. Pickard, safety engineer, who was elected chairman of the committee, completed the personnel.

Background of Meeting

A little history of the work which preceded the San Francisco meeting is needed to fully understand what was accomplished and why it could be accomplished in a single day. Five years ago the Waterfront Employers of Seattle employed a safety engineer, after preliminary surveys had been made, and started in an organized way to reduce the number of accidents to longshoremen. As the work progressed and the causes of these accidents were shown through the investigations of the engineer, rules intended to eliminate similar injuries in the future were adopted by the group and put into effect. These rules eventually developed into the printed book of safety rules adopted by the Seattle Safety Committee in March 1928. The maritime interests of San Francisco made a survey of the whole field of accidents, both to longshoremen and seamen in 1926; and early in 1927 the Pacific American Steamship Association, the Shipowners' Association of the Pacific Coast, and the Waterfront Employers' Union of San Francisco combined to carry on their accident prevention work.

The passage of the Longshoremen's Compensation Act shortly afterwards brought the Federal Compensation Commission into the picture; and the deputy commissioner in San Francisco took a deep interest in the progress of the accident prevention work. He invited the employers and employees to appoint a safety committee to work with him in the development of safety rules for the port and, in September, 1928, the results of this committee's work were approved by the San Francisco associations and published as a port safety code. Los Angeles, Portland, and San Diego started their work in an organized manner a little later, and also started to write port safety rules. The Los Angeles and San Diego groups adopted the San Francisco code. Portland started to draw up a code but never published it. With the passing of 1928, the period of separate port codes on the Pacific Coast ended and the movement to develop a single set of safety standards for the coast started. The wisdom of such a movement was obvious, and when it was suggested by the deputy commissioners at San Francisco and Seattle all of the groups heartily agreed to it.

Preliminary Code Drafts

The San Francisco group took the initiative in the new work, compiled the suggestions from all ports, and submitted them to the port committees for criticism. This draft was revised twice to meet suggestions and reconcile differences of opinion, and on June 3, 1929, a draft that was substantially acceptable to all ports was submitted by the committee. This draft was approved by all of the San Francisco associations and was the draft which the Coast Code Committee was called together to consider on August 3.

Cooperative Organization

Captain Edwards, chairman of the San Francisco code committee, called the meeting to order and, after a hearty welcome to the visiting members, appointed Deputy Commissioner Pillsbury as temporary chairman. Preliminary organization matters were settled and Mr. Pickard was chosen as permanent chairman, and Earle Freeman as permanent secretary. The committee then appointed, as an advisory committee with privilege of the floor, men from each district who have been closely identified with the code work. Frank P. Foisie and M. E. Arkills of Seattle; Harvey Wells of Tacoma; Frank D. Cannon of Portland; Captain Walter J. Peterson, Captain J. W. R. Stewart, and Carl Fry of San Francisco; A. E. Mills and Stanley Davis of San Pedro; and F. C. Gregory of the United States Employees' Compensation Commission were appointed to this board. Those present joined in the discussion of the code.

The committee then settled down to a detailed discussion of the parts of the code upon which there was any disagreement. There were few of these and they were given full consideration and then voted upon. A few amendments, mainly for the purpose of clarifying the rules, were adopted. An excellent spirit of give and take was manifested and when at 5 p.m. all amendments had been considered, the delegates adopted the code by unanimous vote.

As an expression of the majority opinion of the shipowners, stevedores, and longshoremen, the rules are recommended to the industry on the Pacific Coast for voluntary adoption as working rules to govern their operations. The Code Committee, as a permanent organization, will watch their operation and consider amendments from time to time. The port safety committees and the maritime organizations are back of the code and will urge its general adoption. The Federal Compensation Commission has taken a keen interest in the work and has expressed its appreciation of the work done.

Most Comprehensive American Code

The code adopted is by far the most comprehensive work that has been attempted in the United States for the stevedoring industry. It is based upon the accident experience of the Pacific Coast during the past few years and the practical knowledge of the men who have contributed their work to the code. The experience in accident prevention work of other industries has also been available through the experience of some of the technical men. Starting with a real desire to meet the problems squarely, responsibilities of the different groups have been met and rules have been formulated to try and meet all of the more serious causes of injuries. The proper protection and maintenance of ships and stevedores' equipment is covered and provision is made for adopting standards for cargo handling gear. The importance of proper supervision is recognized in outlining the duties of the various foremen positions. Safe working rules to be observed by both foremen and longshoremen, provisions for first-aid on the ships and docks, care of injured men, proper lighting of working places, and safe means of entering ships and holds are other subjects covered.

Reduces Insurance Rates

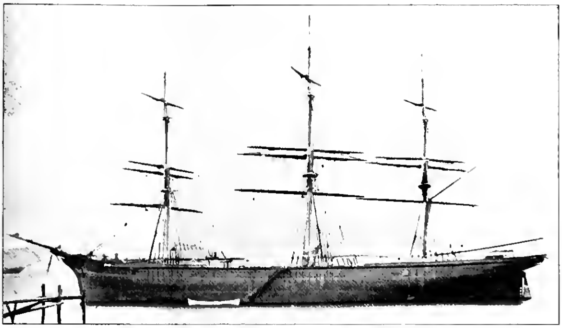
The rules are to be printed in the near future and distributed to the companies in all of the coast ports, the adoption and enforcement of them being entirely optional with the various companies. They have had such wide publicity during their formulation and such slight criticism from the industry that there is reason to expect that they will receive the support of the greater part of the companies. The work which has been done in organized accident prevention in the past few years has already brought about a very substantial reduction in the insurance rates under the Longshoremen's Compensation Act, the saving in premiums amounting to a handsome saving over the cost of the preventive work. This has been accomplished while the work was in the organization stage, and there is ample ground for the belief that still better results are to come in the future.

The Don Juan, Ex-Rosalia, Ex-?

A Mysterious Clipper Ship Whose Complete History Has Baffled All Research and Will Probably Never be Known

By F. C. Matthews

IN April, 1874, a ship of the extreme clipper type dropped anchor in San Francisco Bay after a short passage from Callao, in ballast. She flew the flag of Costa Rica and had the name Rosalia on a carved shield attached to the stern with, however, no hailing port appearing. She was long, narrow, and shoal to a very remarkable degree. Against a length of 201 4/12 feet, her beam was but 32 7/12 and depth of hold 16 5/12 feet. Her tonnage was 667 gross; 647 net. She was of light construction, built mostly of pine and fir and had two decks, the spar deck being flush with cabin below. When laden with cargo she must have presented a beautiful appearance with her long, sharp ends and light, graceful stern. Undoubtedly she could sail fast.



The clipper ship Don Juan at Port Chalmers, April 1875. This broadside view gives an excellent idea of the lines of this extreme clipper ship, which was probably built over 70 years ago.

No. 29995

All efforts to trace the former history of the Rosalia were futile, although later some old cutlasses, carronade balls, and several hundred wrist and ankle shackles were found in her run, the surmise being that she had been a slaver at one period. Painted on the main hatch beam, but not carved in, was the number 29995, which would indicate that she had been surveyed by Lloyd's about the end of the year 1865; but careful search through files of the Register from 1856 failed to find such a number against a ship of any name. A report that she had been built in Sweden in 1856 and had for a time been known as the Don Juan of Liverpool could not be verified; and up to the time she was broken up her past history remained a dark mystery.

The Rosalia reached San Francisco consigned to J. W. Grace & Co. who were agents for her owner, Jose Garcia y Garcia. Shortly after arrival she was sold by auction for 2145 pounds sterling to Walter Guthrie of Guthrie & Larnach, Dunedin, New Zealand, who was then on a visit to the Pacific Coast. Captain Hughes, who had brought her up from Callao, was superceded by Captain Veale; and as the British ship Rosalia she sailed for Port Blakeley to load timber for Port Chalmers on account of her new owners.

Trouble and Disaster

The subsequent career of the vessel was one of trouble and disaster.

After starting from Puget Sound with her timber cargo she had to put back leaky. Some repairs were made, a windmill was installed to assist the pumps, and a second start was made. From the vicinity of Honolulu stormy weather was encountered; the leak increased; the windmill broke down; and, with an incipient mutiny aboard, Captain Veale tried to make Tahiti but was headed off. On the 80th day out he was forced to put into Napier in distress. A steam engine was installed, and after a detention of about three weeks the voyage was resumed and Port Chalmers finally was made after a passage of 110 days from Port Blakeley.

Changed to Don Juan

After discharge of her cargo the Rosalia was docked, certain repairs recommended by the surveyors were made, and she was made ready to sail for Sydney for a thorough overhauling. On May 7, 1875, she was registered at the Dunedin Custom House as the British ship Don Juan. When at the bar outward bound for Sydney, she was stopped by customs and harbor authorities as being unsound and unseaworthy in many ways. She returned to port and was again floated into the graving dock for overhauling. Later she was sold to C. & G. Clark and subsequently to Briscoe & Co., finally going under the flag of the Union Steamship Company of New Zealand, who had her dismantled for use as a store ship. She was broken up in 1904.

Hearts of Oak

THE oldest vessel listed in Lloyds is the Ceres, a trading ketch of 52 tons burden, whose home port is at Bude, Cornwall, England. She was built at Salcombe of English oak in 1811 and has been exposed to the hazards of sea for over 117 years. In her youth she frequently ran the blockade on the Bay of Biscay, defying Napoleon's Navy. During the late great war, fitted with a motor, she successfully ran the blockade of German submarines in Bristol Channel. Her present skipper, Captain R. W. Petherick, has operated her for half a century, and four generations of his family have been connected with her. Her regular run today is between Bude and Cardiff with coal and sand; but she still often plies across the Irish Channel with cargoes of iron from Bristol to Dublin.

Trade, Traffic, and Shipping

The Care of Perishable Cargoes

An Analysis of the Causes of Damage to California Perishables in Maritime Transit and Some Suggestions for Protection of These Cargoes

By David W. Dickie

THE heavy losses entailed now and then in carrying perishable cargoes in and out of Pacific Coast ports are as often attributable to improper stowage as to improper care and custody in transit, so that a wider knowledge than that required to issue an ordinary stowage certificate seems to be requisite.

In the case of some cargoes, the shipper issues a set of instructions that, if followed to the letter, practically relieves the ship of responsibility for damaged or deteriorated goods; but the carrying out of the instructions is usually left to men that are not familiar with the chemical or physical theory behind the instructions.

The day of the practice of just dumping the cargo in the ship and trusting to luck that it will get there has long since passed, and the knowledge required on the part of those responsible for cargo and its stowage will be much more complicated in the future than it has ever been in the past.

California is raising an enormous quantity of perishable fruits and vegetables now, and as time goes on and the more common varieties come down in the price, other varieties of a more rare and delicate nature will take their place, thus increasing the problem of caring for perishable cargoes.

From the standpoint of the operator, on the other hand, freight rates on fruit are much higher than those on grain, for instance; and the captain who does not study the science behind the carrying of fruit will find himself displaced by one who will; while the captain who carries it successfully year in and year out will enjoy a bonus.

A few of the cargoes from, to, and via California that have been notably subject to damage in transit recently are bananas, onions, oranges, and shelled peanuts. The composition of these products is shown in the table herewith:

	Bananas	Onions	Oranges	Shelled Peanuts
Refuse fibrous matter	35.00	10.0	27.0	0.0
Water	48.9	78.9	63.4	9.2
Protein	.8	1.4	.6	25.8
Fat	.4	.3	.1	38.6
Carbohydrates, Sugars and starches	14.3	8.9	8.5	24.4
Ash	.6	.5	.4	2.0
	100%	100%	100%	100%

As each of the items, Refuse and Fibrous Matter, Protein, Fat, and Carbohydrates (sugar and starches) decays or is injured in a different manner and by different chemical processes, each will be described in order.

Refuse and Fibrous Matter. The refuse fibrous matter will decay from fungus attack, the water present nourishing the destructive plant life.

Protein. The term "protein" is used to include normally the total nitrogenous substances of animal and vegetable food materials, exclusive of the so-called nitrogenous fats. Actually it is employed, in common usage, to designate the product of the total nitrogen multiplied by an empirical factor, generally 6.25. Where protein is present in the cargo and atmospheric conditions in the ship, accompanied by the presence of excess moisture, the cargo will develop **mold.**

The mold germ is present in the atmosphere at all times and, when provided with a host in the form of nitrogenous matter and moisture from the humidity of the atmosphere, will take root and sprout in a very short time.

Fats. Fats and oils are liable to turn rancid. **Rancidity** should not be confounded with **acidity,** although rancid oils usually are high in acids. Lewkowitsch holds that fatty acids are liberated by the action of moisture in the presence of enzymes. Enzymes are what might be termed wild yeasts, or unorgan-

The dewpoint temperatures, as listed in this table, were calculated by the author especially for this article and should be of great value to those who are interested in the shipment of perishable cargoes through the tropics.

TABLE ONE

DEWPOINT TEMPERATURES (DEGREES FAHRENHEIT) FOR VARIOUS PERCENTAGES OF HUMIDITY AND AIR TEMPERATURES CALCULATED FROM U.S. WEATHER BUREAU VAPOR PRESSURE TABLES BY C.F. MARVIN.

AIR TEMP DEG FAHR	PERCENTAGE OF RELATIVE HUMIDITY 100	95	90	85	80	75	70	65	60	55	50	45	40	35
32	32	30.67	29.71	28.43	27.14	25.83	24.33	22.80	21.00	19.23	17.21	15.00	12.58	9.97
33	33	31.71	30.54	29.28	27.94	26.61	25.13	23.58	21.85	20.05	18.04	15.79	13.35	10.69
34	34	32.75	31.44	30.22	28.86	27.46	26.07	24.46	22.80	20.83	18.91	16.67	14.21	11.51
35	35	33.73	32.39	31.06	29.76	28.32	26.87	25.32	23.63	21.72	19.76	17.53	15.05	12.32
36	36	34.68	33.36	31.91	30.60	29.17	27.65	26.17	24.43	22.60	20.50	18.36	15.85	13.09
37	37	35.63	34.26	32.89	31.40	30.03	28.47	26.81	25.23	23.42	21.30	18.15	16.63	13.85
38	38	36.70	35.28	33.65	32.34	30.87	29.37	27.74	26.11	24.23	22.20	20.00	17.50	14.68
39	39	37.68	36.29	34.80	33.31	31.71	30.75	28.57	26.90	25.07	23.08	20.72	18.33	15.49
40	40	38.85	37.37	35.88	34.32	32.74	31.12	29.50	27.74	25.96	23.91	21.64	19.19	16.35
41	41	39.62	38.27	36.81	35.22	33.62	31.80	30.29	28.50	26.69	24.66	22.44	19.96	17.12
42	42	40.63	39.24	37.78	36.22	34.56	32.87	31.10	29.36	27.46	25.50	23.33	20.68	17.95
45	45	43.61	42.20	40.66	39.12	37.50	35.70	33.83	31.84	29.97	27.86	25.66	23.17	20.21
50	50	48.62	47.17	45.66	44.09	42.36	40.55	38.66	36.63	34.37	32.00	29.71	27.14	24.33
55	55	53.56	52.12	50.54	48.88	47.17	45.37	43.38	41.30	39.05	36.63	33.91	31.09	28.16
60	60	58.54	57.02	55.47	53.77	52.04	50.15	48.15	46.02	43.73	41.25	38.50	35.47	32.14
65	65	63.51	61.97	60.35	58.64	56.82	54.95	52.89	50.74	48.37	45.83	43.02	39.94	36.67
70	70	68.50	66.80	65.28	63.53	61.63	59.75	57.64	55.45	53.04	50.46	47.62	44.53	41.02
75	75	73.43	71.86	70.16	68.38	66.50	64.53	62.39	60.14	57.66	55.06	52.18	48.18	45.43
80	80	78.43	76.79	75.09	73.27	71.37	69.34	67.14	64.87	62.35	59.67	56.70	53.45	49.82
85	85	83.39	81.71	79.97	78.12	76.16	74.10	71.91	69.54	66.98	64.26	61.23	57.81	54.22
90	90	88.37	86.66	84.89	82.98	81.00	78.89	76.64	74.24	71.67	68.87	65.80	62.41	58.64
95	95	93.34	91.60	89.78	87.65	85.82	83.68	81.38	78.94	76.25	73.45	70.33	66.87	63.04

ized or chemical compounds of vegetable or animal origin that cause chemical transformation. Also if oil is exposed to air and light, the fatty acids are acted upon, causing rancidity. To avoid such changes, fats should be kept in a dark, cool place.

Carbohydrates. The sugars present in fruit or vegetables are usually in the form of dextrose or levulose. These two hydrocarbon compounds have the same chemical formula, $C_6H_{12}O_6$, but differ in crystaline formation and are distinguished from each other by the refraction of a ray of light. Either of these compounds is readily subject to fermentation in ships holds through the agency of wild yeasts which may have been present on the skin of the fruit when shipped or may have been introduced from the air into the ships holds. Sucrose or ordinary domestic sugar, is fermented through a process of conversion into dextrose or levulose or both by the addition of water and the influence of an inversion process due to certain properties in wild yeast.

The starch content in fruits and vegetables, when hydrolized under the influence of wild yeasts, also becomes dextrose or levulose, and so becomes readily fermentable.

The final products of these reactions in each case are **alcohol** and **carbon dioxide.**

One of the principal functions of cold storage is to prevent the action of these wild yeasts in bringing on fermentation. This must be done without preventing entirely their action in changing starch to sugar since this change is one of the most vital in the process of ripening. Hence the importance of close control of temperatures and ventilation in cold storage chambers. Hence also it is highly important that there should be made available accurate data on atmospheric conditions throughout the trade routes on which perishable cargoes are handled.

Atmospheric Conditions

In a paper read before the Royal Society of Arts at London, December 7, 1927, and published in Pacific Marine Review for July 1928, S. J. Duly, M.A., has given a very clear outline of what takes place in a ship when ventilated from the outside air. He gives the following rules for ventilation:

"When a ship containing a warm cargo passes into a cold current of the sea the proper course to take is to ventilate as vigorously as possible, as the moisture deposits on the cold ship's side and runs down into the bilges. Closing the ventilators with falling outside temperatures becomes dangerous, because of the increasing humidity of the hold with the consequent growth of mold and the risk of the condensation under the deck dripping back on to the cargo. . . . General high humidity of the hold is not enough to cause damage where the cargo and the air therein are warm . . .

TABLE TWO

BALBOA HEIGHTS THE PANAMA CANAL

MEAN OF BI-HOURLY AIR TEMPERATURES IN DEGREES FAHRENHEIT

DEPARTMENT OF OPERATION AND MAINTENANCE

SUBSECTION OF HYDROGRAPHY SECTION OF SURVEYS

	YEAR 1927.												YEAR 1928.								
DAY	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	DAY
1	780	787	778	818	778	779	772	772	784	765	778	778	772	793	791	804	797	782	772	779	1
2	777	788	788	818	776	782	790	790	778	794	774	787	772	80.2	79.3	811	813	783	793	782	2
3	775	767	789	823	792	802	792	786	772	780	773	766	764	808	799	816	798	773	782	763	3
4	786	777	796	817	792	803	788	773	788	802	778	770	776	808	798	804	804	764	772	776	4
5	774	792	785	816	795	787	761	783	79.1	767	769	787	772	795	806	800	809	768	766	786	5
6	787	804	782	824	782	782	782	785	787	77.2	737	783	752	80.2	816	806	766	787	736	803	6
7	762	799	794	817	768	774	791	788	752	765	793	788	763	799	808	798	802	791	783	806	7
8	776	785	804	812	782	813	780	784	777	779	799	769	736	78.7	810	818	797	799	80.2	795	8
9	780	792	810	812	793	797	792	796	782	797	798	773	78.2	78.2	80.4	827	806	793	784	770	9
10	783	774	806	769	792	760	809	769	797	795	788	788	761	77.4	798	806	766	801	776	770	10
11	784	788	802	774	769	771	809	768	79.8	793	76.8	792	791	775	78.8	805	815	775	786	776	11
12	794	769	802	759	763	78.0	80.2	757	753	775	77.4	794	779	78.2	792	816	813	802	779	77.6	12
13	80.4	802	802	792	794	788	798	77.2	779	788	775	799	78.5	788	80.2	818	808	76.6	790	783	13
14	794	800	792	808	820	783	798	784	780	791	792	793	794	802	80.8	792	802	78.1	818	782	14
15	786	795	789	816	782	789	80.2	802	768	788	787	763	796	811	80.2	798	792	76.8	834	789	15
16	786	755	807	805	772	76.3	78.5	812	764	798	78.0	77.3	799	81.8	799	82.1	79.5	78.2	82.2	786	16
17	774	775	81.1	790	799	773	778	787	785	80.1	771	779	805	80.9	802	815	799	791	82.5	78.9	17
18	782	764	808	790	794	778	78.5	808	776	79.7	766	791	789	79.5	802	816	788	80.7	82.3	778	18
19	789	751	812	788	782	76.8	768	80.0	763	788	772	797	792	80.3	799	815	76.7	778	82.1	790	19
20	786	773	819	796	78.3	789	782	794	758	76.9	775	798	80.1	813	818	82.4	77.1	78.5	825	776	20
21	788	776	816	788	790	78.9	78.1	78.9	783	779	767	769	800	81.2	812	817	786	788	818	798	21
22	780	759	807	800	77.3	769	78.0	798	778	764	774	76.9	794	816	801	801	799	777	82.2	775	22
23	78.0	75.8	809	810	771	76.7	77.9	797	787	771	792	793	78.7	81.7	815	808	78.8	785	798	775	23
24	762	768	816	794	793	790	772	788	75.2	76.2	788	802	790	815	80.6	777	819	793	806	78.1	24
25	764	768	815	781	808	788	76.8	800	788	770	779	798	78.8	817	79.9	792	792	76.0	80.7	774	25
26	782	774	805	765	798	772	80.5	78.7	783	783	79.7	792	793	798	79.8	79.8	80.3	75.0	812	747	26
27	782	767	803	793	766	776	799	804	805	77.2	794	789	75.8	76.0	816	806	812	78.0	809	766	27
28	782	764	812	784	783	79.9	790	772	80.1	781	803	788	784	792	800	784	766	786	78.1	763	28
29	793		812	798	792	769	806	76.6	77.4	762	80.0	795	77.2	792	814	811	785	788	792	792	29
30	799		807	787	78.6	779	789	792	76.8	78.1	760	789	780		816	808	794	796	797	79.6	30
31	799		819		76.4		776	80.1		782		775	783		816		792		808	802	31

TABLE THREE

CRISTOBAL THE PANAMA CANAL

MEAN OF BI HOURLY AIR TEMPERATURES IN DEGREES FAHRENHEIT

DEPARTMENT OF OPERATION AND MAINTENANCE

SUBSECTION OF HYDROGRAPHY SECTION OF SURVEYS

	YEAR 1927.												YEAR 1928								
DAY	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	DAY
1	784	808	792	822	773	773	774	801	816	77.7	792	738	796	812	806	822	821	789	806	798	1
2	798	788	80.3	827	789	807	801	818	797	784	784	786	806	812	792	818	823	786	799	793	2
3	806	795	808	828	79.3	80.5	799	810	769	80.4	788	783	797	808	811	821	836	784	806	78.2	3
4	804	811	806	822	804	826	787	793	803	809	785	792	805	806	815	821	832	775	777	80.3	4
5	795	80.3	802	822	802	796	789	813	831	773	792	792	791	807	798	800	823	790	769	811	5
6	792	807	807	816	802	794	782	809	764	782	804	798	792	803	813	815	794	802	771	81.3	6
7	802	802	811	818	810	798	790	806	773	777	792	791	802	808	822	806	819	803	802	826	7
8	792	809	814	820	805	82.6	779	789	796	795	81.5	790	807	810	818	824	828	818	808	814	8
9	765	807	818	822	817	817	813	808	803	796	805	779	735	786	818	826	829	810	80.3	799	9
10	805	805	817	806	799	770	830	806	803	805	789	802	80.2	807	798	827	811	81.1	789	776	10
11	793	80.4	810	812	802	800	832	785	797	800	765	807	812	805	802	823	827	790	806	789	11
12	80.2	791	809	808	773	800	808	773	763	765	758	805	80.5	797	792	832	838	818	800	78.1	12
13	807	80.3	812	806	802	807	808	798	788	798	788	821	809	80.5	812	832	835	779	812	796	13
14	810	80.0	812	815	822	809	810	799	778	79.8	80.1	816	814	812	816	811	815	79.8	83.2	790	14
15	802	802	808	832	801	804	819	811	77.8	811	792	802	814	816	816	818	82.2	798	843	798	15
16	805	77.8	803	817	793	79.2	80.9	81.9	776	820	79.2	80.5	815	820	809	829	80.2	784	84.2	801	16
17	805	796	817	813	800	762	789	768	79.5	820	779	797	813	818	806	833	799	814	835	79.7	17
18	799	783	823	812	807	78.7	807	818	789	80.8	78.3	805	814	816	814	824	802	821	838	781	18
19	80.1	759	81.0	813	799	80.1	759	819	792	800	76.2	801	819	815	82.2	812	781	786	835	794	19
20	816	76.8	817	809	786	818	794	821	802	789	797	827	815	819	816	820	780	799	84.3	77.5	20
21	814	795	812	810	796	810	802	815	781	785	767	789	819	82.2	812	813	811	81.7	837	808	21
22	811	784	81.6	818	790	790	792	834	795	766	789	772	811	80.8	812	822	80.1	772	841	78.3	22
23	81.2	776	824	816	793	78.8	798	808	811	777	796	798	803	819	811	817	810	79.2	820	804	23
24	810	78.9	82.2	816	810	796	798	789	813	783	805	812	808	817	801	821	824	80.7	81.0	80.1	24
25	801	800	819	804	806	812	78.1	808	808	782	800	816	806	817	795	82.5	843	791	816	78.2	25
26	802	789	820	772	808	78.8	811	778	78.4	785	792	803	810	82.0	812	826	83.4	76.4	837	770	26
27	803	782	807	801	797	796	804	788	812	782	794	798	809	814	81.8	822	83.2	76.8	838	796	27
28	810	78.2	82.2	806	77.7	812	804	766	824	787	803	802	807	802	82.6	826	78.3	806	799	769	28
29	808		816	805	798	798	81.3	781	78.3	76.1	807	815	78.2	809	808	833	806	80.2	808	801	29
30	809		81.7	818	800	797	813	804	784	796	803	814	80.0		819	826	808	808	797	805	30
31	787		819		773		803	813		792		802	80.9		817		80.8		830	812	31

TABLE FOUR

BALBOA HEIGHTS THE PANAMA CANAL
MEAN OF BI HOURLY HUMIDITY PERCENTAGES
DEPARTMENT OF OPERATION AND MAINTENANCE
SUBSECTION OF HYDROGRAPHY SECTION OF SURVEYS

	YEAR 1927												YEAR 1928								
DAY	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	DAY
1	83	82	78	73	69	89	91	88	88	92	85	85	63	76	72	65	80	91	94	91	1
2	79	81	78	61	89	89	88	87	86	84	69	85	75	74	73	68	81	89	84	88	2
3	82	74	67	71	67	84	89	86	91	88	85	92	75	75	71	67	86	92	87	92	3
4	80	76	67	76	86	83	90	86	85	86	87	84	73	72	68	74	82	92	89	86	4
5	81	75	66	75	87	88	93	88	82	93	85	78	75	78	72	78	79	90	89	86	5
6	75	75	68	70	92	89	86	86	88	93	84	78	76	72	66	77	78	86	94	82	6
7	76	82	73	73	86	92	84	60	94	94	88	82	78	72	67	78	70	86	77	84	7
8	85	83	74	75	90	84	92	64	84	85	87	89	79	72	69	74	73	86	81	85	8
9	66	75	73	81	91	89	88	82	85	86	89	89	75	75	70	73	65	86	87	86	9
10	81	76	74	92	50	96	85	87	84	67	89	87	75	75	70	79	88	87	88	87	10
11	80	76	70	89	91	91	83	84	83	87	92	78	72	76	76	75	77	94	87	86	11
12	77	78	72	51	92	91	88	89	55	90	88	76	80	72	74	72	73	84	90	86	12
13	78	76	73	83	88	87	88	63	85	88	87	76	76	74	75	63	85	93	88	86	13
14	78	77	68	76	87	88	87	83	66	82	85	81	74	73	72	78	86	88	82	87	14
15	78	75	72	76	91	89	88	86	85	89	88	85	77	70	71	75	88	87	77	88	15
16	78	90	77	75	91	91	87	84	91	83	92	88	75	73	75	69	88	90	81	86	16
17	78	80	76	78	86	91	90	86	83	82	92	86	71	74	80	68	88	90	82	84	17
18	77	78	79	77	89	90	92	86	92	80	94	86	73	73	72	64	88	87	83	86	18
19	79	86	77	73	69	88	91	89	90	84	92	86	77	70	70	71	92	91	84	85	19
20	80	77	74	72	92	87	87	89	87	92	84	87	75	72	70	73	87	81	84	88	20
21	76	71	76	80	89	89	92	96	92	88	86	94	75	75	64	76	66	85	84	85	21
22	76	75	77	79	93	92	88	91	62	93	84	95	82	74	66	85	65	85	83	91	22
23	78	81	75	70	92	94	87	85	84	90	87	88	78	74	63	82	89	88	86	89	23
24	78	77	73	74	87	88	91	90	96	90	90	85	76	75	77	89	80	86	84	88	24
25	74	77	72	78	82	86	88	90	85	90	88	84	76	74	86	85	88	92	84	89	25
26	74	74	69	90	90	92	86	90	87	89	86	82	73	74	66	83	86	93	82	95	26
27	70	73	72	88	96	88	88	89	83	89	85	75	71	80	81	81	85	86	84	66	27
28	70	80	69	92	92	87	82	91	88	85	90	77	71	77	82	88	94	88	88	87	28
29	76		68	88	90	90	80	93	92	89	88	78	76	68	77	84	86	87	83	86	29
30	76		66	92	93	87	86	86	94	87	94	79	75		76	70	87	85	87	86	30
31	79		70		95		86	83		85		82	76		70		87		86	84	31

Where a ship sails suddenly into warm waters with a comparatively cold cargo on board the aim should be to seal the hold up before the rise in temperature sets in to prevent the warm air from condensing on the cold cargo."

Air of any given temperature can carry in suspension a certain **maximum** amount of moisture and when so doing is said to be saturated. When the moisture exceeds this amount it precipitates in the form of rain or dew.

Table I gives the dew point or temperature at which moisture will deposit for various temperatures of air, as given in the left hand column, and various percentages of relative humidity, as given across the top.

For example, at 84 degrees Fahrenheit and 30 inches barometric pressure (sea level conditions) every cubic foot of air contains 12.37 grains of water when saturated and, if the humidity is 70 per cent., the air contains $12.37 \times 0.70 = 8.69$ grains of water per cubic foot and can absorb $12.37 - 8.69 = 3.68$ grains more before condensation takes place.

If the air is cooled by coming in contact with the ship's hull, cooling pipes, or cargo which is at a lower temperature than the air, it becomes saturated at a lower barometic pressure, and the temperature corresponding to this lower pressure is the temperatnre of the dew point given in the table.

In the case of a cargo of peanuts, let us assume that they are transferred to an intercoastal vessel at San Francisco in the latter part of June 1927, when there was a prevailing average temperature of 75 degrees Fahrenheit, the average humidity being 60 per cent. and the dew point 60 degrees Fahrenheit. The vessel puts to sea with the sea water and air temperature at 55 degrees Fahrenheit, which is below the dew point of the inside air. The inside of the hull of the vessel which is in contact with and cooled by the sea water will condense the moisture of the air in the form of sweat.

This is the case in which vigorous ventilation is necessary to carry off this moisture, cool the cargo, reduce the humidity within the hold, and reduce the dew point as rapidly as possible from 60 to 41.3 degrees Fahrenheit, which is the corresponding dew point for air at 55 degrees Fahrenheit and 60 per cent. humidity.

In this case the sun shining on the deck will keep the deck fairly warm and the sea water will keep the sides of the vessel cool; so, barring bad weather wherein the ventilators must be closed, the cargo should be carried in good condition.

The next variation is the one that does the damage; that is, where the ship and cargo are reduced in temperature to 55 degrees Fahrenheit and pass into the tropical current which averages 83 degrees Fahrenheit.

Let us assume further that this vessel, which was loaded in the lat-

TABLE FIVE

CRISTOBAL THE PANAMA CANAL.
MEAN OF BI-HOURLY HUMIDITY PERCENTAGES
DEPARTMENT OF OPERATION AND MAINTENANCE
SUBSECTION OF HYDROGRAPHY SECTION OF SURVEYS

	YEAR 1927.												YEAR 1928.								
DAY	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	DAY
1	82	76	83	69	86	81	69	84	80	86	64	85	76	77	66	66	74	90	69	88	1
2	82	80	79	68	83	76	80	80	89	84	87	87	70	80	76	71	79	87	87	89	2
3	75	72	73	68	85	81	84	77	88	85	83	86	76	84	70	72	76	91	87	88	3
4	75	72	73	71	82	77	85	82	81	83	85	80	70	81	66	72	77	90	90	80	4
5	79	77	73	67	82	88	80	77	79	81	86	82	74	78	79	80	76	88	87	82	5
6	78	81	75	69	83	87	80	72	82	86	65	76	76	77	74	77	76	87	88	83	6
7	74	85	75	67	81	83	80	71	88	86	90	82	76	75	69	77	67	63	77	85	7
8	67	85	79	69	82	80	81	86	80	85	82	87	78	67	73	76	67	63	84	87	8
9	91	74	79	74	82	86	87	85	80	85	87	86	76	77	73	77	69	88	89	86	9
10	82	75	75	78	66	94	82	89	84	82	86	83	78	70	76	80	69	85	89	88	10
11	80	75	75	77	82	90	81	83	84	85	92	79	77	71	74	80	81	90	86	89	11
12	84	80	75	73	86	85	86	92	90	64	91	80	79	72	79	74	75	85	89	86	12
13	82	77	73	69	61	83	85	81	81	81	84	74	74	72	73	70	80	93	84	87	13
14	76	77	66	69	78	81	83	81	83	79	78	74	75	76	71	79	85	66	81	88	14
15	75	78	70	67	84	84	85	84	82	78	87	77	79	79	69	77	87	86	80	85	15
16	79	87	85	68	81	87	83	83	80	75	88	80	75	80	76	76	87	90	80	84	16
17	73	72	83	67	78	95	87	85	82	77	90	80	75	76	80	75	90	87	84	88	17
18	72	78	65	65	80	82	81	82	82	77	86	83	73	75	76	73	87	87	84	84	18
19	79	88	81	63	82	77	93	86	79	80	93	85	74	72	69	80	95	92	84	86	19
20	76	80	80	65	90	75	86	85	77	85	82	81	76	76	76	82	92	83	81	90	20
21	71	71	84	70	85	81	86	84	84	84	88	91	78	75	70	84	84	81	82	85	21
22	72	74	80	67	85	92	86	77	83	93	84	95	82	79	70	63	87	95	82	90	22
23	71	75	77	66	82	88	82	85	77	88	88	91	81	78	72	91	87	91	84	85	23
24	72	73	80	67	77	82	86	94	75	86	88	83	77	82	82	78	82	83	84	88	24
25	72	67	72	75	80	78	84	89	77	64	83	82	73	77	92	76	80	88	88	91	25
26	70	66	66	86	85	92	84	91	84	84	90	83	75	71	83	75	82	90	79	92	26
27	71	70	74	89	86	85	89	89	80	84	86	79	77	74	82	73	84	84	81	86	27
28	72	81	66	87	87	87	84	91	80	83	89	76	72	73	77	80	92	82	92	90	28
29	75		69	84	81	84	80	91	92	91	88	75	81	65	85	78	82	83	83	88	29
30	76		65	83	82	84	82	82	89	79	88	77	76		77	70	85	85	90	89	30
31	80		70		84		84	79		62		76	76		75		86		80	85	31

ter part of June, arrives at the Panama Canal about July 15, 1928.

We find from Table II that on July 15, 1927, the average air temperature was 80.2 degrees Fahrenheit at Balboa Heights and from Table III the average air temperature at Cristobal was 81.9 degrees Fahrenheit, so for the canal we can assume 81 degrees Fahrenheit. From Table IV we find the average relative humidity for July 15, 1927, at Balboa Heights was 88 per cent, and from Table V we find the humidity at Cristobal was 85 per cent. For the canal we can assume a humidity of 86.5 per cent. From Table VI we see that the dew point at 8 A.M. on July 15, 1927, at Balboa Heights was 76 degrees Fahrenheit and, from Table VII, we see that the dew point at Cristobal was 77 degrees Fahrenheit. For the canal we can assume a dew point of 76.5 degrees Fahrenheit.

It is not possible to check Table I absolutely from the data given, as the temperature and relative humidity are averages for the day and the dew point is one reading taken at 8 A.M. However, interpolating from Table I we find that at 81 degrees Fahrenheit and 85 per cent. humidity, the dew point is 76.3 degrees Fahrenheit.

When the moist air strikes any surface that is below 76.3 degrees Fahrenheit, condensation takes place and moisture deposits on the cold surface whatever it may be.

If the above air is introduced into a ship that has been cooled to 55 degrees Fahrenheit inside, with humidity 60 per cent. and the dew point 41.3 degrees Fahrenheit, the air temperature will fall due to absorption of the heat by the ship and cargo.

Let us assume that the warm air, entering the ship at 81 degrees Fahrenheit, 86.5 per cent humidity, and 76.3 degrees dew point, comes in contact with ship and cargo as described above and leaves the updraft ventilators at say 65 degrees Fahrenheit. If the humidity has remained constant the dew point temperature has fallen to 61.3 degrees. As the internal temperature (55 degrees) of the cargo is lower than 61.3 degrees, some of the moisture of the air will deposit on the cold cargo and the ship's hull until the relative humidity has fallen to some value between 60 and 86.5 per cent. that of the internal and external air respectively. When the dew point is stabilized at 55 degrees, the moisture will cease condensing and remain in suspension.

The percentage of humidity corresponding to an air temperature of 65 degrees Fahrenheit and a dew point temperature of 55 degrees is 71 per cent. from the table.

These figures are intended to illustrate in a general way what takes place. Hence there is deposited a definite known quantity of water the moment the following factors are determined:

(Article and Section Continued on Page 25, Blue Section)

TABLE SIX.

BALBOA HEIGHTS THE PANAMA CANAL

DEW POINT TEMPERATURES AT 8 A.M. IN DEGREES FAHRENHEIT

DEPARTMENT OF OPERATION AND MAINTENANCE

SUBSECTION OF HYDROGRAPHY SECTION OF SURVEYS

	YEAR 1927												YEAR 1928								
DAY	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	DAY
1	70	75	71	75	76	74	76	73	75	73	74	74	72	73	70	65	72	76	75	76	1
2	72	72	73	74	74	75	72	75	75	75	71	73	71	75	67	71	75	76	75	73	2
3	71	70	71	72	77	73	75	75	74	73	73	74	70	74	70	70	76	75	76	74	3
4	72	71	70	73	75	73	75	74	74	76	75	75	71	72	69	71	74	75	72	72	4
5	72	72	69	73	75	74	73	74	73	76	75	73	71	72	71	71	73	72	75	74	5
6	71	72	68	71	77	74	77	72	72	75	75	71	70	72	72	72	73	76	74	74	6
7	71	73	72	73	77	74	73	74	74	73	76	73	73	72	70	72	69	77	71	77	7
8	72	74	72	72	75	74	75	74	72	74	76	74	72	71	70	73	71	75	75	75	8
9	73	72	72	75	77	77	75	75	74	75	76	75	72	71	71	74	71	76	75	75	9
10	72	71	73	74	76	76	77	76	72	74	74	74	72	71	70	75	72	76	75	73	10
11	72	72	73	74	76	74	74	72	76	75	74	73	72	71	72	75	76	77	75	73	11
12	73	72	72	73	75	76	75	73	73	74	75	73	72	72	71	73	75	75	75	73	12
13	75	73	72	73	74	74	75	72	72	74	74	72	72	72	72	73	75	76	76	73	13
14	74	72	71	74	77	75	76	72	72	72	75	75	71	73	71	71	76	74	77	74	14
15	73	71	69	72	73	76	76	76	74	76	76	73	71	73	71	73	75	75	76	73	15
16	73	71	71	73	71	76	72	76	73	76	78	73	72	71	71	73	75	74	77	72	16
17	71	70	72	72	74	73	72	77	71	72	75	74	72	74	72	72	76	76	77	75	17
18	71	70	75	71	78	75	75	76	73	72	75	74	72	72	72	71	75	76	76	74	18
19	72	72	74	70	76	73	73	77	72	75	74	74	73	70	70	73	75	76	76	75	19
20	72	74	73	70	76	77	74	76	74	73	72	75	72	71	73	73	73	72	77	76	20
21	72	71	73	72	75	76	76	76	73	73	73	75	73	73	72	74	74	75	77	74	21
22	72	68	73	74	75	75	74	76	74	74	71	76	75	74	70	75	75	75	76	75	22
23	70	68	72	72	74	75	74	74	74	73	75	76	73	75	73	76	74	75	74	75	23
24	72	68	71	71	74	75	74	76	74	74	75	75	72	73	70	74	74	76	76	75	24
25	70	70	73	73	76	73	72	76	73	74	76	74	71	73	74	75	75	75	75	77	25
26	71	68	71	73	75	77	74	76	74	74	75	75	72	73	74	74	77	74	75	75	26
27	71	67	72	71	76	77	75	76	74	74	74	74	72	72	75	74	77	73	76	74	27
28	69	71	72	75	73	75	76	76	76	73	76	72	72	71	74	74	74	75	75	76	28
29	70		72	76	74	75	76	73	76	71	74	74	69	70	74	76	74	73	73	74	29
30	75		69	76	75	73	76	75	75	72	77	75	71		72	70	75	75	76	78	30
31	74		71		77		77	74		74		71	72		72		76		75	75	31

TABLE SEVEN.

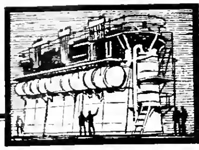
CRISTOBAL THE PANAMA CANAL

DEW POINT TEMPERATURES AT 8 A.M. IN DEGREES FAHRENHEIT

DEPARTMENT OF OPERATION AND MAINTENANCE

SUBSECTION OF HYDROGRAPHY SECTION OF SURVEYS

	YEAR 1927.												YEAR 1928.								
DAY	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	DAY
1	74	74	74	73	76	73	76	75	76	72	75	76	72	73	69	70	72	75	77	76	1
2	75	74	74	74	72	75	74	76	77	74	75	74	69	73	70	72	74	75	77	75	2
3	74	71	70	74	75	74	77	76	75	78	74	75	71	76	70	72	75	75	78	74	3
4	73	72	70	74	76	76	76	75	74	77	74	74	71	75	70	72	74	75	74	73	4
5	73	72	71	73	74	76	73	76	77	76	76	72	72	73	73	71	73	72	76	75	5
6	74	72	74	74	77	77	75	73	74	74	75	74	72	73	73	73	73	75	75	75	6
7	72	76	73	73	76	75	74	72	74	75	75	73	73	72	72	72	69	77	71	77	7
8	74	75	74	73	77	77	75	76	73	76	76	75	74	70	71	74	71	75	75	76	8
9	75	71	73	74	78	77	76	76	74	75	78	74	70	71	72	74	74	77	75	75	9
10	74	72	73	76	76	77	78	78	75	75	75	76	72	71	71	76	73	75	75	72	10
11	74	72	74	74	76	74	77	74	76	76	75	74	72	71	71	76	77	76	75	74	11
12	75	73	70	74	75	75	77	74	75	76	73	72	73	72	71	74	76	76	75	74	12
13	76	73	73	72	75	76	76	72	74	74	74	74	70	72	73	74	76	75	77	76	13
14	73	73	69	73	77	76	77	74	73	74	74	74	74	73	70	75	75	74	77	76	14
15	73	73	72	74	74	76	77	75	75	76	76	74	73	75	70	72	77	75	77	74	15
16	73	73	74	72	76	75	76	78	72	75	76	75	74	74	73	74	74	72	78	73	16
17	71	71	74	69	76	77	74	75	75	74	74	74	73	74	74	75	77	77	79	76	17
18	74	72	74	70	76	74	72	76	75	74	77	76	72	72	74	73	76	76	78	74	18
19	74	72	75	70	76	74	74	77	73	76	74	77	74	70	72	74	77	76	78	76	19
20	74	71	74	71	78	74	75	78	71	74	75	77	74	73	75	76	76	74	77	76	20
21	73	72	76	73	76	73	76	77	75	73	73	77	74	74	70	77	76	75	78	75	21
22	72	70	74	73	76	76	74	77	75	76	72	76	74	74	71	76	77	76	77	77	22
23	74	71	74	71	74	75	75	77	75	74	74	77	72	74	73	76	76	76	76	75	23
24	72	70	74	73	76	75	76	77	75	75	76	75	74	73	72	76	76	75	76	75	24
25	71	70	74	74	76	76	72	73	72	75	74	75	72	75	76	76	78	78	75	74	25
26	71	69	73	74	75	77	76	73	75	74	75	74	72	73	76	76	77	75	77	76	26
27	70	70	74	78	77	76	76	77	75	74	76	74	75	74	76	75	79	74	77	74	27
28	71	74	74	76	75	76	75	77	77	73	77	73	70	72	74	76	75	74	74	76	28
29	73		73	76	75	78	76	77	77	73	77	74	72	70	75	75	73	73	73	73	29
30	73		71	78	74	73	74	76	76	72	76	73	71		74	74	76	76	76	74	30
31	75		74		77		77	74		73		72	73		74		76		76	73	31



In the Engine Room

Geared Versus Electric Drive for Merchant Vessels

By A. Peterson, De Laval Steam Turbine Co.

THE choice of propelling machinery for merchant ships is just now widely discussed by marine engineers and others, having reached even the columns of the "Saturday Evening Post." This discussion began with the introduction of the steam turbine and the internal combustion motor into marine service, and each new development has opened up further possibilities for difference of opinion. The reciprocating steam engine remains about as it was, but internal combustion advocates now have 2-cycle and 4-cycle systems, directly connected, with electric transmission and geared, from which to choose; while the steam turbine camp, which has long since abandoned directly-connected turbines, disputes the relative merits of mechanical speed reducing gears and electric transmission.

The arguments advanced fall into two classes, empirical and theoretical. The former quote over-all results actually attained in the way of first cost, reliability, absence of noise and vibration, fuel consumption, weight and space requirements, upkeep and attendance, etc., arguments which appeal to owners and operators, particularly to nontechnical men who are not equipped or inclined to analyze the operation of power plants and to determine what is essential and peculiar to a given system as against what may be immaterial or generally applicable to all systems.

The theoretical method of argument, which is suitable for engineers studying engineering problems, is to segregate the nonessentials from the essentials and to draw exact comparisons between parallel component parts or assemblies of the several systems, making suitable allowances where changes in one part of the equipment affect other parts. For example, the boilers and auxiliary equipment with a geared turbine installation develop less power and require less fuel than is required for an electric drive installation of the same power. Roughly speaking, about half of the advantage of geared drive with respect to first cost and fuel consumption comes from the requirements of less auxiliary power. Such substantial advantages should not be ignored. The only accurate way to make such a comparison is to compare complete machinery installations, taking everything into account and including differences in propeller revolutions as well as in auxiliaries, where such exist, as, for example, on vessels of slower speeds.

In an article,"Steam Turbine Electric Drive for Merchant Vessels," by H. C. Berrian, Asst. Chief Engineer, Newport News Shipbuilding & Dry Dock Company, which originally appeared in May, 1929, issue of the "Journal of the American Society of Naval Engineers," and which was reprinted in the August issue of "Pacific Marine Review," arguments based on both over-all results and analysis of performance, as well as some analogies between central stations and marine power plants, are presented in such a way that geared turbine drive for merchant vessels appears to be discredited, while turbine electric propulsion is promoted.

Naval Practice

The over-all results arguments adduced by Mr. Berrian can be offset by numerous instances which favor gear drive. For example, he mentions the introduction of electric propulsion in the United States Navy as a subject which presumably needs no further discussion; but does not mention the fact that there are now in commission in the United States Navy ten 7500-ton light cruisers having four shafts and normally rated at 90,000 shaft horsepower each, all propelled by geared turbines, nor that there are now building eight 106,000-shaft horsepower cruisers, while Congress has authorized 15 more of the same type, as well as a 60,000-shaft horsepower, twin-screw, aircraft carrier, a total of 24 new ships to be propelled by geared turbines, nor that the British, French, Italian, and Japanese Navies have many high powered naval vessels of all types propelled by geared turbines, a large number being of over 100,000 shaft horsepower. Mr. Berrian himself undoubtedly would not cast any doubt on the efficiency or reliability of DeLaval gears installed by his own company in the cruiser now building at Newport News, nor would he imply that the successful cutting of such 26,500 horsepower gears as accepted by the shipyard and by the navy, was at all problematical.

All together, the United States Navy has over 10,000,000 shaft horsepower of geared turbines, as against a total of only 632,000 shaft horsepower of turbine electric drive in navy, coast guard, and merchant marine together, over half of which is in two ships, neither of which, according to current reports, stands strictly at the top in respect to either economy or reliability. Four reputable gear manufacturers in the United States, namely, De Laval, Falk, General Electric, and Westinghouse, have millions of horsepower of successful marine gear installations in operation in practically every type of seagoing vessel, including almost 300 installations of 28,000-shaft horsepower gears in twin-screw, turbine driven destroyers in the United States Navy. The foregoing facts leave little force in Mr. Berrian's remark that "as the power of the geared steam turbine increases, it gradually becomes increasingly difficult to provide adequate and reliable reduction gears."

Central Station Parallel

It is not sufficient to claim that "the principles involved in electric transmission on shipboard are identical with those which have been thoroughly worked out in central

station practice," and that "it is quite natural that the United States, which has been the leader in electrical development on land, should be the leader in electrical development on shipboard," since many circumstances of power application on shipboard differ from corresponding land practice. Land central stations are nearly always interconnected, and the turbine generators are invariably run at constant speed, 60 cycles frequency being most generally used, which sets the turbine speed at 3600, 1800, or 1200 revolutions per minute. Central station turbine generators are, further, frequently designed, in order to make the most favorable combination of efficiencies, speeds, loads, weights, and costs, to pass through one, two, or even three critical speeds in reaching the standard running speed. Again the load absorbing appliances on land are as a rule comparatively small and scattered over a wide area, whereas the marine load absorber is located near the turbine and takes the entire output. To employ all the complicated appliances required in the distribution of electric power over hundreds of miles to many small consumers for the purpose of transmitting a single large unit of power over a few feet does not seem "natural" when there is at hand so simple and reliable a means of transmission as the mechanical speed reducing gear.

It is generally accepted as good practice in designing marine propelling machinery to have no critical speed within the maximum propeller speed of the unit. The marine prime mover, except for direct-current turbine generators, which are restricted to quite low powers, must necessarily be capable of continuous operation at variable speeds. Contrary to an apparently widely held belief that electric drive turbines always run at constant speed even when the propeller runs at reduced speed, the fact is that the ratio of turbine speed to propeller speed is fixed by the respective numbers of poles in generator and motor. In order to keep down the weight, cost, and size of propelling motors so that they can be used to propel ships, the minimum possible number of poles in the motor is desirable. The mechanically geared turbine does not suffer from any such limitations of speed and ratios. By the use of compound or triple expansion turbines, the turbine shafts can be made short enough so that the critical speed will be above the maximum running speed, no matter how high the turbine speed nor how low the propeller speed may be set for reasons of efficiency. The speeds of electric drive turbines appear on the other hand to have been selected in accordance with land designs.

Steam Conditions

Mr. Berrian's statements that the designer of turbine-electric propulsion equipment finds himself with a free hand in determining steam conditions and that the single, relatively high speed, turbine rotor constantly revolving in one direction has been thoroughly worked out in land practice for pressures and temperatures in excess of anything that he will probably care to adopt, carries the implication that the geared turbine is somehow or other inferior in these respects. The fact is, however, that the turbine is not the limiting factor with respect to temperature, the boiler, superheater, and piping setting the limits in this respect. Furthermore, the following geared turbine vessels have much higher steam conditions than do any electric turbine equipments now in service:

Dixie, 350 lbs. per sq. in., 200deg. F. superheat, 28½in. vacuum.

King George V, 550 lbs. per sq. in., 800 deg. F. total temperature, 28½in. vacuum.

Duchess class ships, 350 lbs. per sq. in., 250deg. F. superheat, 28½in. vacuum.

Experienced geared turbine manufacturers are prepared to build marine units to run satisfactorily at any steam pressure or temperature which reputable steam boiler manufacturers are willing to supply.

Regenerative heating of feed water by means of steam bled from the main turbine is a feature common to both systems of turbine drive, and the same methods of generation and distribution of power to auxiliaries may be used in either case. There is no question about the desirability of practically complete electrification of deck and engine auxiliaries, and nearly all reputable marine engineers recognize their efficiency, simplicity, and reliability. Electric auxiliaries supplied with current from small, high efficiency condensing turbine generators are just as efficient on geared turbine vessels as on turbine electric vessels, and, in addition, the geared turbine drive does not require current for excitation as does the turbine electric drive. In the case of the steamship California, for example, additional auxiliary power amounts to 185 kilowatts for excitation and motor ventilation, corresponding to about 2900 pounds of steam per hour.

The suggestion of dual drive of the auxiliary generator by an auxiliary turbine and by a synchronous motor receiving current from the main units on the turbine-electric vessel is paralleled on the geared turbine ship by direct coupling of the auxiliary generator to the main unit, with the avoidance of generator and motor transmission losses.

Space and Weight

As regards space occupied by propelling machinery, the engine room length on the Virginia is stated to be about 6 feet less than would have been required for a geared turbine installation. The gear drive installation compared with the Virginia was probably not well designed, because in nearly all cases gear drive machinery requires no more, and usually less, space.

In respect to weight, the geared turbine with double reduction gears shows up still better, assuming the proper turbine speeds for maximum economy and reliability with low propeller speeds. Where the propeller speeds necessitate only one step of gearing, the geared turbine generally weighs only one-half as much, or even less, as does the turbine electric drive for the same propeller speeds and steam conditions, including in the comparison turbines, generators, motors, lubricating system, exciter and foundations, cables, main control board, Kingsbury propeller thrust bearings, proportionate amount of additional weight for auxiliary condenser due to excitation, and proportionate extra weights of main boilers and condensers required by the turbine electric drive ship, due to lesser inherent efficiency of electric transmission.

As an example of the weight and space requirements of the two forms of drive, should the navy decide to put geared turbine propelling machinery in the Saratoga, reliable, efficient geared turbines with condensers and condenser auxiliaries could be placed in the space now occupied by the main motors alone, and would weigh substantially the same as these motors, while the weight represented by the present generators, cables, controls, exciters, ventilating blowers, foundations, condensers, etc., including two main boilers, would be saved.

Fuel Consumption

The claim that there is no appreciable difference in fuel consumption as between geared turbine and turbo-

electric propelling machinery of the same power and for the same steam conditions, propeller revolutions, and safety factors ignores the fact that transmission through speed reducing gears is 3 to 5 per cent. more efficient than through generator and motor, and even more when the excitation for generator and motor and ventilation for the motor are included.

In comparing turbine with turbine, it is necessary to make certain assumptions in reference to the type of turbine that is to be used in each case. The main turbine for ship drive should be built with a stiff shaft, as flexible shaft turbines are not rugged enough to be satisfactory on board ship. It is not possible to build a single shaft turbine of 8000 horsepower or larger with a stiff shaft that will give as high economy as can be obtained in a two or three casing turbine, such as would be used as part of a geared turbine propelling unit. The advantages gained by the multiple casing turbine through its ability to use different and suitable speeds for the high and low pressure parts and to use more stages, while still retaining the stiff shaft feature, more than compensate for losses due to additional stuffing boxes, to a constantly rotating reversing element and to steam friction through cross-over connections.

If the proper practice in design were followed, all electric drive turbines would be of the compound type in order to secure a flat fuel rate curve. It is impossible to obtain a flat fuel rate curve with a single turbine and with the electric drive turbines as at present designed. For both high pressure and low pressure turbine elements to run at the same speeds is disadvantageous for the high pressure turbine. On the other hand, geared turbines are designed for exactly the best speeds and the high pressure turbine runs at a higher speed than the low pressure turbine.

The superiority of the geared turbine with respect to fuel consumption is well borne out by the attested performances of ships now in regular service. Mr. Berrian cites the fuel consumption for all purposes of the California as 0.764 pound per shaft horsepower, and that of the Virginia and Pennsylvania as 0.723 pound, the California using steam at 275 pounds pressure and 100 deg. Fahrenheit superheat, while the Virginia and Pennsylvania are designed for 300 pounds pressure and 200 degrees Fahrenheit superheat. As against these figures we have the performance of the Dixie, of about half the tonnage and power, of 0.783 pound of oil for all purposes with steam auxiliaries, which would become 0.66 pound of oil per shaft horsepower for all purposes if the Dixie were equipped with electric auxiliaries of the same type and efficiency as those used on the California.

Mr. Berrian further estimates that if the Virginia and Pennsylvania were equipped with air heaters, and high pressure bleed feed water heaters, the oil consumption could be brought down to 0.65 pound per shaft horsepower. In comparison with this figure may be placed the estimate of a reputable shipbuilder on double geared turbines for a recent twin-screw job requiring approximately 22,000 shaft horsepower of an oil consumption of 0.55 pound per shaft horsepower for all purposes, based on steam at 375 pounds gauge and 725 degrees Fahrenheit total temperature, with 28½-inch vacuum. The builder further offered to guarantee this estimate with a margin of 6 per cent.

Reliability

The claim of superior reliability for the turbine electric drive is borne out neither by actual performances of ships in service nor by arguments based upon the combinations which can be made between two turbine generators and two or more electric motors. In a single screw ship, where one generating unit is provided, the compound geared turbine has some advantage, as it can be separated into two turbines, either of which may be used independently of the other. Compound geared turbines are provided with blind flanges, and the piping is so arranged that either the high or low pressure turbine can be cut off and the other operated at half power. In the twin screw ship, where two generating units are provided to develop full power, turbine electric drive has certainly no advantage over two compound geared turbines.

In general, reliability depends more on conservative design and ample factors of safety than on anything else. Presumably for the purposes of reducing the price differential to a minimum, while striving for good steam economy, the turbines offered for marine electric drive have been designed with factors of safety and shaft charactertistics such as are used in constant speed land practice.

Marine service is unquestionably much more severe than land service, and requires a much greater margin of safety if wheel rupture, loss of turbine buckets, etc., as reported from several notable recent electric drive installations, are to be eliminated.

Geared turbine machinery is more simple in operation than is the turbine electric drive, since the latter contains many more elements requiring supervision, adjustment, and overhaul. As for the alleged advantages of electric meters, these are subject to errors such that they cannot be relied upon in detecting small changes in efficiency of the units. When acceptance tests are run on central station equipment, the station instruments frequently do not agree with the manufacturer's instruments and often neither set agrees with specially calibrated instruments obtained from the testing laboratory. As for reading off power being developed at any instant, this is, with a given turbine, quite definitely determined by the steam conditions and speeds, and may readily be tabulated or shown in curves for the convenience of the men in the turbine room.

Passenger Comfort

The comfort of passengers and crew is much talked about by electric drive advocates, but there is as much freedom from vibration with present day geared turbines as built by manufacturers who have proper facilities and experience as with turbine generators and motors built by anyone. The windage noise of turbine generators and motors is as great or greater than the noise of properly cut gears as manufactured by experienced concerns. This fact may be demonstrated by a visit to the steamship Dixie or the steamship Waialeale, the geared turbines of which cannot be heard outside of the engine rooms. The possibility of propeller racing is no different in a geared ship than in one in which the propeller is coupled to the generator through a synchronous motor, and in either case can be controlled by a speed governor.

Condensers

The condenser arrangements described by Mr. Berrian are not in any sense peculiar to the turbine electric generator, and were first used in marine practice in connection with geared turbines, as, for example, in the Japanese, British, and Chilean destroyers and cruisers, on the Duchess and Empress classes of ships of the Canadian Pacific Steamship Co., and in the steam-

ships Dixie and Waialeale, and altogether there are some 50 geared steam turbines in American vessels having bottom exhaust and underneath condensers.

Conclusions

We hear constantly that the American merchant marine is handicapped because American ships cost more to build. Geared turbine machinery is superior for merchant vessels because, everything considered, it will earn higher dividends. This results from the following:

1. The first cost of the machinery installation is from 5 to 15 percent less.
2. The fuel consumption is considerably less.
3. The reliability of the geared turbine is greater for the reason that the factors of safety are much higher than those of the electric drive turbines and there is less complication.

Shipping Board Honor Roll for 1928

THE Fuel Conservation Committee of the United States Shipping Board, Merchant Fleet Corporation, announces its semiannual Honor Roll and Honorable Mention List of Chief Engineers and Masters, covering the six months period July 1, 1928, to December 31, 1928.

The Fuel Conservation Committee is composed of representatives from organizations concerned with the operation of ships and was formed about seven years ago to advise the Shipping Board as to means to reduce the fuel expenditures of their vessels. The committee is composed of Captain C. A. McAllister, president of the American Bureau of Shipping, chairman; Captain R. D. Gatewood, C.C., U.S.N., Ret'd., manager, Maintenance and Repair Division, Merchant Fleet Corporation, vice-chairman; W. T. Hayes, assistant director of operations, Merchant Fleet Corporation; Professor Herbert L. Seward, professor of Mechanical Engineering, Yale University; Professor Lawrence B. Chapman, Massachusetts Institute of Technology; Colonel G. Bartlett, operating manager, Cosmopolitan Shipping Company; Fred B. Low, editor of "Power"; F. B. Webster, of "Marine Age"; J. J. Fagan, chief engineer of the steamship Leviathan; and C. A. Greaser, secretary. The Fuel Conservation Section of the Fleet Corporation, which is responsible for carrying out the Committee's policies, is headed by C. J. Jefferson.

This honor roll consists of fifty ships, representing the best performers of the fleet, and is accompanied by an honorable mention list of fifty vessels, whose performance, while falling short of the standard required for the honor roll, was so good as to deserve mention. These vessels were selected from the reports of 254 active vessels inspected during this period. The total mileage covered by the vessels in the six months was 5,820,541, the hours at sea being 563,179.5 and in port 475,890.5. To entitle an honor roll listing, a vessel must have travelled at least 20,000 miles during the period and must have attained a combined sea and port efficiency equal to or better than 95 per cent. of that obtained by the leader of her class and equal to or better than 95 per cent. combined efficiency.

In spite of the large progressive fuel savings made in the several years past and the increasing age of the vessels, it is interesting to note that the fuel economy has still further continued during this six months period. This saving in fuel consumed taken in conjunction with the low prices of fuel oil now prevailing, represents a sizeable saving in the fuel bill. Comparing the last half of 1928 with the first half of 1928, there has been an actual fuel saving of $221,905.67. This value is arrived at by multiplying the difference in pounds of fuel per mile by the miles travelled, to determine the saving at sea, and multiplying the total port hours by the difference in fuel per hour consumed in port, to determine the port saving, and then multiplying the combined algebraic sum by the average price of fuel which prevailed during this period.

						ENGINEER		
[illegible] FRANCE [illegible]	McNEI SPURT	L J CRITE	[illegible] PETERS	19	INDEPENDENCE	[illegible] GBRANE	[illegible]	
[illegible] LINE	BERKLEY	[illegible]	[illegible] GARDINER	16	BARREADO	W HUNTING	D M [illegible]	16
					BANGU	H MUSGRAVE	C NORMAN	6
AMERICAN DIAMOND LINES	[illegible]	[illegible]	R A HEGE	20	AMBRIDGE	H K BERRY	J F McCULLOUGH	20
					ALA	J ANDERSON		31
AMERICAN GULF ORIENT LINE					INVINCIBLE	S.H CORNELL	F. ULSTADT	38
AMERICAN MERCHANT LINES	QUAKER CITY	H HUNTLEY	[illegible]	5	LEHIGH	S MILLER	[illegible]	
10 VESSELS	AMERICAN TRADER	C R [illegible]	[illegible] FISH	73	CITY OF FLINT	E M KEARNEY	T J THOMASSEN	5
					AMERICAN FARMER	H.E COMSTOCK	H.S MYDDLETON	73
AMERICAN [illegible] LINE	JALAPA	C G GUNTHER	R LARSEN	24	WEST LESASSUCK	C PEEL	C E DUNTON	12
	ALGIC	A D PRATT	C H BATCHELDER	31	ARCHER	J D BOYD	H SATFELDT	38
	LUKEMONT	J E TURPIN	J DRIGGS	34	UNICOI	D A HORN	H MILDE	76
	HANSLER	K MORTON		36	CITY OF DALHART	R H BOND	R ROSE	
	WEST CUSSETA	D MENTZER	D HOLTH	77	WILLIAM PENN	A PANCOTT	R.H WRIGHT	
26 VESSELS	SEMINOLE	A FOSTER	H HUDSON					
AMERICAN REPUBLICS LINE					BAKERSFIELD	S GAMBLE	J A GAINARD	FRA
13 VESSELS					THE ANGELES	W L CLARK	T E MARSHALL	14
DIXIE MEDITERRANEAN LINE	QUISTCONCK	C B BROWN	G OLOFSON	5				
	JOLEE	E TILLOTSON	H MULLER	5				
	LABETTE	E GLAZE	A MIDJO	5				
7 VESSELS	SCANTIC	G CARLSON	R [illegible]	5				
DIXIE U K LINE	AMERICAN PRESS	A C BARICHWICH	R KING	5	WEST WAUNA	A B CUMMSKEY	J C WENZEL	12
	MOUNT EVANS	R A CAMPBELL		12	WEST CADDOA	E H SWEENEY	C A SOYLAND	FRA
14 VESSELS	WEST IVIS	C MODERSOHN	C E McLAIN	18	DUQUESNE	W ZIGLER	G D TIPTON	19
GULF BRAZIL RIVER PLATE LINE 14 VESSELS	SCHOODIC	P W BOONE	C O OLSEN	5	BIBBCO	L ERICKSEN	E F JONES	5
GULF WEST MEDITERRANEAN LINE	JOMAR	C E PEPPER	D E GRIFFIN	5	PRUSA	J McKERRAL	B J CHESHIRE	5
	CARLTON	J B WALSH	J D MASON	5	LAFCOMO	O ROGERS	J M DUNN	5
	OGONTZ	J VON HEIN	C CLARK	5	SAPINERO	W R JONES	A JOHANNESSEN	5
	WEST CHETAC	J E FEEL	A ELLIS	FRA	CAPDONIA	M P SMITH	J V. TOULME	5
8 VESSELS					WEST CHATALA	S.T PRITCHETT	I M HOLT	12
MISSISSIPPI VALLEY EUROPEAN LINE	COLD BROOK	M H EVANS	H FAHRENWALD	5	CRANFORD	P J BATTAM	A W JAMISON	74
	CARPLAKA	A R ISAACSON	H P SMITH	5				
5 VESSELS	SYROS	H C [illegible]	S C WALLACE	74				
MOBILE OCEANIC LINE	WEST HIKA	P ZIESKE	R H SWEETING	14	AFOUNDRIA	J.L JONES		5
	HASTINGS	R T LENON	Y NYSTAD	31	MAIDEN CREEK	P GALAGEZ	E L WHEADON	5
					WEST HARDAWAY	J SHERLOCK	E M FRIPP	12
					WEST MADAKET	W C HERWIG	A K CHRISTENSEN	12
					WEST GOTOMSKA	W LINDEN	R L HOOPER	12
					FEDERAL	J L CHURCHILL	J O SEIBER	13
					BRADDOCK	L NEINREITHER	L P RESSIJAC	19
14 VESSELS					ANTINOUS	M BREISTEN	D.A STEWART	25
ORIOLE LINES	COELLEDA	L HENKEL	W R OWENS	5	COLD HARBOR	J C KRAFT	C W LORIN	5
	CLAIRTON	L W LITTLEFIELD	H.L BOWEN	20	WINONA COUNTY	P H RANKIN	R B ATHERTON	20
	KERHONKSON	E C ORNE	J BROADWICK	30	BALSAM	C RICE	S U FORD	29
10 VESSELS	HOXIE	W A GRENZ	T M LEWIS	40				
SOUTHERN STATES LINES	AQUARIUS	F FREDERICKSSON	H WARD	25	CONNESS PEAK	T JERRETT	G P TOWNSEND	
	ELDENA	R B WARD	H A MILLER	33	WEST CAMAK	K E NELSON	D R WILLIAMS	74
					EFFNA	L C WHALEY	H.S OLSEN	22
					OAKMAN	W A MANNEY	W B MEREDITH	25
					BAYOU CHICO	A TRACHTENSEN	H F JOHNSON	31
					DAVENPORT	J P TIERNEY	F WARD	31
24 VESSELS					EDGEMOOR	I J BODDEN	R HANSEN	33
TEXAS STAR LINE	CODY	E S RASMUSSEN	E J MADDEN	5	CLIFFWOOD	J BURKS	J V SMITH	5
	YOUNGSTOWN	C R CROSIER	A JOHNSON	19	SAHALE	F A DUENO	C T McMAINS	5
	WESTMORELAND	W E LUND	F S PACKARD	19				
	ENDICOTT	R [illegible]	H HATCH	22				
11 VESSELS	KADAN	H GROTEWAT	H A OLSEN	25				
TEXAS UKAY LINE	WEST EKONK	P C BREAUX	H SIMMONS	12	COLLINGSWORTH	C BERG	J STEIN	5
	CRIPPLE CREEK	C FREDERICKSON	J P FORREST	22	WEST DURFEE	H KERR Jr.	A L KEHOE	12
	COLORADO SPRINGS	T E ROMAN	J P ORWIN	33	ELMSPORT	J E TSAVARIS	E M DIERLAM	33
12 VESSELS	STEADFAST	A PFLORES	H J DIERLAM	50				
UNITED STATES LINES	PRESIDENT HARDING	J B MORRIS	W RINE	5	PRESIDENT ROOSEVELT	J TURNER	T VAN BEEK	5
	LEVIATHAN	J J FAGAN	H CUNNINGHAM	49				
	GEO WASHINGTON	W G GRACE	A B RANDALL	62				
	AMERICA	P BREMAN	G FREID	63				
6 VESSELS	REPUBLIC	A W STYRGA	A M MOORE	75				
YANKEE LINE	LORAIN	E L INNESS	J McCAULK	19				
9 VESSELS	NATIRAR	J J MADDEN	F STEVENS	39				

Workboats and Their Power Plants

Three Super-Fishing Vessels

ON July 6 and 11 there were launched at the plant of the Campbell Machine Company, San Diego, two 117-foot trawlers for the southern California deep-sea fishing fleet. These vessels are built of Oregon pine in the staunchest manner possible to the designs of Manuel Madruga, naval architect and superintendent of construction at Campbell Machine Company. These vessels were named Invader and Navigator.

The Invader has a beam of 25 feet and a draft of 10 feet 6 inches and will be powered with a 350-horsepower, 7-cylinder, directly reversible Union diesel engine. As auxiliary power she will have a 30-horsepower, 2 - cylinder, Union diesel, direct-connected to a 33-kilowatt Westinghouse generator, and a 40-horsepower Fordson tractor engine direct-connected to a 17-kilowatt Westinghouse generator.

The Navigator has a beam of 27 feet and a draft of 11 feet 6 inches, and will be powered with a 400-horsepower, 6-cylinder, directly reversible Union diesel engine, and for auxiliary power will have one 45-horsepower, 3-cylinder, Union diesel engine direct-connected to a 30-kilowatt, Westinghouse generator.

Above, upper view shows the Navigator just after launching. Central view shows launching party with sponsor ready to christen the Navigator. Lower view shows Invader just after launching.
Below is shown a general view of the outfitting wharf of the Campbell Machine Company of San Diego, with fishing boats outfitting for the tuna season.

The auxiliary machinery and equipment of these two vessels will be practically identical, and will consist of an anchor windlass, manufactured by the Campbell Machine Company and driven by a 5-horsepower Westinghouse motor, a cargo winch also manufactured by the Campbell Machine Company and driven by a 5-horsepower Westinghouse motor. There will be two bait pumps, one a 6-inch discharge 8-inch suction Byron-Jackson pump direct-connected to a 7½-horsepower Westinghouse motor and the other a 5-inch De Laval bait pump also direct-connected to a Westinghouse motor of 7½ horsepower.

Bilge water will be taken care of by a Campbell pump direct-connected to a 3-horsepower motor. A Trench marine bilge pump direct-connected to a 2-horsepower electric motor will take care of the circulating water for cooling the ammonia condenser. The refrigeration system is to be taken care of by a 5- to 8-ton York ammonia type refrigerating machine, the compressor being driven by a 10-horsepower Westinghouse motor.

An Edison storage battery will be installed to take care of emergencies and of the lighting system, and in each vessel a 30-kilowatt Westinghouse electric generator is to be installed for belt drive off the main engine.

Comfortable accommodations are provided for a crew of 14 men. Diesel and lubricating oil tankage is provided for a cruising radius of 7000 miles, and it is expected that in each case the propulsion plant of the vessel will produce a speed of 12 knots. These two vessels comprise the latest type of fishing boat used by the southern California

fraternity for deepsea fishing, and will be in line for any expansions of the fishing activities toward the Hawaiian Islands.

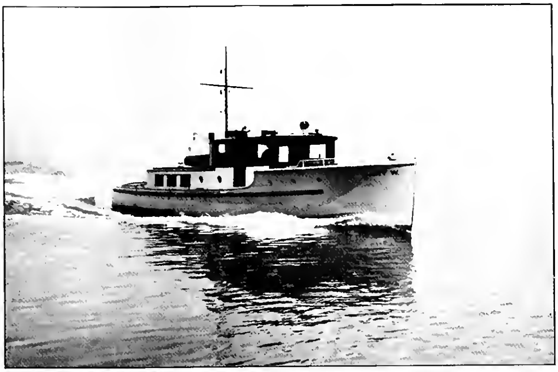
The third large deep-sea fishing boat, the Sao Joao, was launched at the Campbell yard July 27 for J. O. Medina and Sabina J. Inos. She is 120 feet long, with a beam of 26 feet and a draft of 11 feet 6 inches. Her main engine will be a 400-horsepower, 6-cylinder Union direct-reversing marine diesel.

She has a very unusual equipment for auxiliary power, having installed a 45-horsepower, 3-cylinder Union diesel direct-connected to a 30-horsepower Westinghouse generator and a 45-horsepower Hercules gas engine direct-connected to a 20-kilowatt generator and a 30-kilowatt generator belt-driven from the main engine.

On their long trips for bait fishing on the deep-sea banks, it is exceedingly important to these vessels that the bait in their tanks be kept alive with a continuous stream of fresh sea water. Hence the duplication of electric power sources for pump power to avoid any possibility of a shut down. The Sao Joao is equipped with a 5 to 8 ton York ammonia type refrigerating system driven by a 10-horsepower electric motor and has 3000 lineal feet of 1¼ inch ammonia coils in the ceiling of the fishing hold.

An interesting feature of the launching of this ship was the blessing of the vessel immediately after launching by Reverend Father Roar of Point Loma, San Diego. It is customary with the Portuguese fishermen to provide for this blessing of their boats, and also to carry in the boat a fully equipped altar.

The total cost of the vessel is $95,000.



The Mary W, built by the Bellingham Marine Railways for the Bellingham Canning Company. This speedy patrol and supply cruiser is powered with a 175-horsepower Hall-Scott engine.

Workboat Notes

Hough & Egbert, Inc., marine distributors at San Francisco for the products of Walter Kidde & Co., manufacturer of Rich Smoke Detection System and Lux fire extinguishing system, announce the installation of Lux fire extinguishing system on Mr. Simmon's cruiser Beautyfest; also on A. L. Weil's yawl Corsair and William Ulfelder's express fishing boat.

Anderson & Cristofani, boat builders at San Francisco, are enjoying considerable work at their yard at Hunter's Point.

Among the new jobs is a splendid little 23-foot sailing craft of Marconi rig, designed by **C. Padgett Hodson** of San Francisco for Henry Barg, San Francisco shipping man. This craft will be used for outside and bay cruising and in sturdiness is somewhat similar to the famous Chance owned by Ben Brooks.

An order has been received for a 32-foot day boat, along fishboat lines, for Sam Weston of Santa Clara, to be powered with a 16-horsepower **Atlas** gas engine.

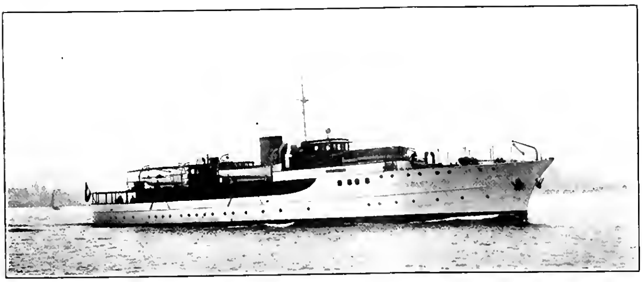
A 50-foot sardine lighter for a Monterey fisherman is under way.

Two 46-foot fishboats for the S. Larco Company are near completion.

Among repair jobs recently carried out at this plant was that to the 65-foot diesel powered cargo boat Eight Brothers of Stockton, which sank with a full cargo of barley off Pinole Point. She was raised by the Harbor Tug & Barge Co. and repaired by Anderson & Cristofani.

The Swedish built 60-foot steel cruiser Beautyrest, owned by Frank P. Simmon of San Francisco (for-

(Section Continued on Page 29, Blue Section)



THE CARISSIMA

This beautiful seagoing diesel yacht, designed by Cox & Stevens, New York, and built by Krupps in Germany, was recently delivered to James A. Talbot in Los Angeles. 184 feet 6 inches long, 28 feet beam, 15 feet 6 inches depth, 10 feet draft, she is powered with two Krupp diesel engines with a total of 1100 horsepower on twin screws. Her sea speed is 14 knots; cruising radius, 7000 miles.

Auxiliaries-Ship Supplies-Marine Equipment

Shaw Metal For Marine Bearings

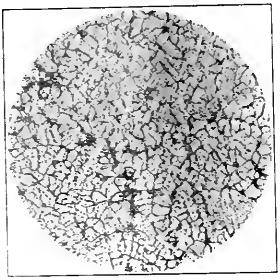
Pacific Coast Metallurgical Research Engineers Furnish Homogeneous Alloys to Best Meet All Bearing Conditions on Shipboard

By Nelson Shaw

IN the modern steamer or motorship, we have a complex mass of machinery which, for its successful functioning, depends on the efficient and economical operation of many mechanisms. Each of these mechanisms, whether its motion be reciprocating or rotary, is more or less dependent on a bearing or bearings. Many of these mechanisms in long voyages at sea must be in constant use, sometimes under very difficult conditions and sometimes with the safety of the vessel and her passengers, crew, and cargo dependent upon the operation of the machinery. It will therefore be quite obvious that bearings are very important factors in the operation of modern ocean-going vessels.

Naturally, then, the question, "What is the best metal for a given bearing under a given condition?" has had considerable attention from marine engineers. In fact the marine engineering departments of some large ship operating companies, both American and foreign, have consistently tried out various bearing metals and possess large masses of data on this subject. As part of the knowledge gained from these records, it has long been recognized that for many purposes the ideal bearing metal would be the proper combination of copper with large percentages of lead in a stable, homogeneous alloy.

Copper and lead, however, in the ordinary processes of metallurgy do not like each other. They naturally refuse to combine and produce a homogeneous alloy such as is necessary to stand up under hard bearing service. These metals melted together will, on cooling, separate into a layer of copper on top with a very small percentage of lead, and a layer of lead on the bottom with a very small percentage of copper.



A micrograph of Shaw bearing metal, magnified by 100 diameters, showing the remarkably homogeneous structure of this alloy.

The research engineers of the International Metals Company have perfected methods of properly mixing an alloy in various proportions of copper and lead to suit all ordinary or special bearing services. This alloy is known as Shaw Metal and possesses a number of peculiar properties that give it special advantages as a material for marine bearings.

Advantages of Shaw Metal

Some of the advantages of Shaw Metal for bearings are:

1. Shaw Metal has high compressive strength.

2. Shaw Metal has high tensile strength.

3. Shaw Metal has a lower coefficient of friction than the best of nickel babbitt.

4. Shaw Metal has a high proportion of lead and will not bleed or lead sweat under any condition.

5. Operating temperature can reach 1200 degrees Fahrenheit.

6. Shaw Metal will not score the shaft under any condition.

It is evident that a metal possessing such qualities will be a great boon to the marine engineer, particularly in the many bearings aboard ship which operate under hard or intermittent service in locations where lubrication is apt to be neglected. A partial list of such applications would include:

Capstan shaft bearings,
Windlass wildcat bearings,
Winch bearings,
Forced draft blower bearings,
Crosshead brasses,
Crank pin brasses,
Wrist pin brasses,
Shafting bearings,
Pump glands,
Steering gear bearings,
Turning engine bearings, and the bearings of all intermittently used auxiliaries and particularly the bearings of intermittent service pumps. Shaw metal is making good in many such installations afloat.

The International Metal Sales Company, with executive offices in the Kohl Building, San Francisco, is managing the world-wide marketing of Shaw Metal. Robert E. Duffy, sales engineer of the International Metal Sales Company, is a former operating marine engineer of considerable ocean experience who is keenly alive to the problems of marine engineering. He knows the kind of service conditions that bearings have to meet at sea and is confident that Shaw Metal can meet and successfully overcome the most difficult of these conditions. Expert metallurgical and engineering advice on bearing problems is available through the technical staff of the International Metal Sales Company. Marine distribution of Shaw Metal in the San Francisco Bay area is being handled by Charles E. Lowe, 162 Steuart Street, San Francisco.

Nonferrous Alloys on Shipboard

PROSPECTIVE building programs of the world's merchant marine and navies indicate the construction of 3,000,000 gross tons of shipping per year, according to a survey of the marine field recently completed by the Copper & Brass Research Association. The survey points out that at the beginning of the present year merchant shipping under construction in all countries totalled 2,607,000 tons, of which 1,212,000 tons were steamships and 1,395,000 tons were motorships. Great Britain had 705,000 tons of steamships and 536,000 tons of motorships under construction, Germany 226,000 tons steam and 157,000 tons motor, and the United States 37,000 tons steam and 5000 tons motor.

In naval construction, unless some great advance is made in limitation of armament or there is abrogation of treaty schedule, the survey predicts that during 1929 to 1941 replacement of capital ships will probably reach 1,715,000 tons, of which the United States and Great Britain will each build 525,000 tons. In addition to replacement, a practically equal amount of new tonnage will be built by the world's navies in the form of aircraft carriers, cruisers, destroyers, submarines, and auxiliary vessels.

"The world tonnage of steam and motor vessels above 100 tons displacement," says the survey, "amounted to about 63,250,000 gross tons on December 31, 1928. The idle tonnage of the world amounted to 3,947,000 tons. It is considered that the majority of this idle shipping is of no further value and that the chief yearly decline in the idle shipping will take place through scrapping of these units. The yearly increase in world total tonnage should amount to about 1,000,000 tons. An average of 1,000,000 or more tons is lost or broken up each year and about 2,500,000 tons is continuously under construction. No decrease in world construction is indicated.

"The United States now finds itself possessed of about 10,000,000 tons of shipping, nearly 500 per cent. more than in 1914. A great deal of this is war heritage and almost 3,000,000 tons is now idle. Eventually, it is believed, this idle tonnage will be scrapped as there is little possibility that it could be operated at a profit in competitive ocean trade. Of the remaining 7,000,000 tons much is obsolete and is losing money. For this reason it will be retired from service as time and circumstances warrant.

"Considering the prospective building programs, which will amount to about 3,000,000 tons per year, the potential market for copper in this field could approximate 600,000,000 pounds per year purely for use in new construction, if all possible equipment were made from this metal or its alloys. It is not assumed, of course, that this amount of consumption is in prospect at present. Repairs to the 60,000,000 or more tons of present ships will not require such an amount due to the enduring quality of the copper alloys, but in the constant modernization of these ships it is considered that 100,000,000 pounds of copper is a small estimate of the amount used each year."

One of the interesting facts disclosed by the survey is that a modern 30,000-ton ship might be as much as one-tenth copper represented by 6,000,000 pounds of copper installations if all appropriate parts were copper. The bronze propellers may contain 53,500 pounds of copper, shaft sleeves 53,000 pounds, main propelling machinery 200,000 pounds, electrical gear and wiring 3,000,000 pounds, and even such inconspicuous installations as voice tubes may require 100,000 pounds of copper.

Sea chests are an integral part of the hull. These are of bronze and in a large ship will weigh 300,000 pounds or more. In a ship such as the Leviathan the copper alloys used in the direct-drive turbines

DIA. IN INCHES	CIRCUM IN INCHES	HARD LAID HEMP FOR STANDING RIGGING, 4 STRAND: LENGTH IN FEET	WEIGHT	SOFT LAID HEMP FOR RUNNING AND MISCELLANEOUS RIGGING, 4 STRAND: LENGTH IN FEET	WEIGHT	SOFT LAID HEMP, 3 STRAND: LENGTH IN FEET	WEIGHT	BOLT ROPE FOR SAILS, 3 STRAND: LENGTH IN FEET	WEIGHT
5/16	1								
7/16	1 1/4								
15/32	1 3/8								
1/2	1 1/2	2496	250			954	80	2039	204
9/16	1 3/4					4722	496	194	23
5/8	2	1603	257	300	48	14460	2314	907	151
3/4	2 1/4	1230	246			10310	2199	17[illegible]	353
13/16	2 1/2	1895	508	20112	5358	130	34	1951	492
7/8	2 3/4	2388	761	16046	5078			1188	368
1	3	4268	1600	20443	7465			1282	469
1 1/16	3 1/4	4746	2140	14299	6430			1087	470
1 1/8	3 1/2	3774	1887	9506	4753			538	172
1 1/4	3 3/4	1155	674	1100	642			115	64
1 5/16	4	5905	3936	6158	4107				
1 3/8	4 1/4	596	447	400	300			696	509
1 1/2	4 1/2	2695	2246	2640	2200			87	70
1 9/16	4 3/4	2730	2594	5184	4925			202	178
1 5/8	5	965	1030	928	990			216	216
1 3/4	5 1/2	1628	2100	590	765			1160	1276
2	6			915	1419				
2 1/8	6 1/2								
2 1/4	7	840	1722	1296	2657				
2 1/2	7 1/2			100	239				
2 5/8	8	1183	3254						
2 7/8	8 1/2								
3	9	2054	7189	120	420				
3 1/8	9 1/2	3104	11919	240	900				
3 1/4	10			150	600				
3 5/16	10 1/2								
3 1/2	11								
3 5/8	11 1/2								
3 3/4	12	420	2798						
TOTALS		45665	47558	100567	49296	30576	5123	13228	5015

SMALL STUFF AND CABLE LAID HEMP

NAME	LENGTH IN FEET	WEIGHT
MARLINE		1059
HOUSELINE		2000
ROUNDLINE		2000
DEEP SEA LINES		43
#2 SPUN YARN		562
#3 "		500
6 THD SEIZING		1200
9 THD "		900
6 THD RATLINE		1200
9 THD		8
12 THD		700
15 THD "		104
18 THD "		1176
21 THD "		2694
1 3/4 "		100
TOTAL		15082
CABLE LAID 14 CIRCUM	320	2343
CABLE LAID 19 CIRCUM	175	2745
CABLE LAID 22.5 CIRCUM	175	3780
TOTAL		8868

SUMMARY

NAME	FEET	LBS
4 STRAND HARD LAID	45665	47558
4 " SOFT "	100567	49296
3 "	30576	5123
BOLT ROPE	13228	5015
MISCEL STUFF		15082
CABLE LAID	670	8868
TOTAL		130942

NOTES
LENGTHS TAKEN FROM BOSTON PLANS #13027 - #14722
WEIGHTS GIVEN ARE FOR TARRED HEMP

U S FRIGATE CONSTITUTION
LENGTHS AND WEIGHTS OF HEMP ROPE FOR RIGGING CABLES AND SAILS
NAVY YARD BOSTON

DRAWN BY / TRACED BY — SUPERVISOR / CHIEF DRAFTSMAN

APPROVED ... 5 1929 John A. Lord FOR MANAGER

50670

An interesting table showing the quantities of rope used on a sailing vessel.

amount to over 5,000,000 pounds.

The requirements of magnetic compasses demand the use of non-magnetic, non-rusting metals. Non-magnetic and finishing plating in a large ship will account for 100,000 pounds of copper.

"One of the largest demands for the metal in the marine field is for electrical purposes. The requirements vary, of course, from the ordinary demands of lighting and ventilation on a prewar freighter to the enormous demand on a post-war battleship. Probably the greatest demand is on an electrically propelled battleship such as the Tennessee. This ship has enormous generators for transforming steam into electrical power and enormous motors for transmitting this power to the propellers. Electricity furnishes power and lighting for the ship's use, power for steering gear, anchor gear, ventilation, turret training and elevating motors, boat cranes, communication system, machine tools, galley equipment, ammunition hoists, fire control system, and numerous other purposes. The total wiring required amounts to many carloads and the actual weight of copper is enormous.

"Due to the gradual absorption by private firms of the government-operated lines in the United States the shipbuilding interests of this country should show greatly increased industry. American-owned shipping now handles about 30 to 35 per cent. of our own exports and imports, and the desire of American steamship companies to secure a larger percentage of this trade will demand faster, more economical, and larger ships to compete with those being built by foreign interests."

Diesel Engine Manufacturers Organize Association

WITH the rapid growth in the use of diesel engines in all type of industrial, public utility, and municipal service, as well as in the railway, automotive, aviation, and marine fields, the manufacturers of diesel engines have realized the need for a closer contact with each other and with the problems of the user. As a result, twelve of the leading builders of diesel engines in the United States have organized the Diesel Engine Manufacturers' Association. The association has as its primary object the advancement of diesel power in America and a broad program of cooperation with the users of this type of power.

Possibly the greatest benefit to the users of diesel power will come through the development of suitable standards of manufacturing and engineering practice. Such active problems as specifications for oil fuels, wider distribution of accepted fuels, and similar subjects will have the attention of the manufacturers.

It is also the intention to promote and extend the use of diesel power. In accomplishing this object, more information will be made available on the application of diesel engines in all types of service. In this connection the association anticipates the helpful cooperation of the technical trade, and business press of the country in presenting the story of what diesel power is accomplishing all through the broad range of industry.

During the past few years there has been much definite progress in diesel engine design. The manufacturers feel that the next most important step is to take greater advantage of the economies of diesel engines in all types of application work. In the struggle to reduce production costs in all lines of manufacturing, power cost plays such an important part that the diesel engine is effecting marked savings. In the field of power distribution, represented by the public utility organizations, there is now a definite trend towards the use of diesel power. In this field it is expected that the diesel engine will play an increasingly important part as the years go by.

In marine service more than half of the world tonnage now being built is equipped with diesel engines and in the workboat field practically no other type of power is being used. The first airplanes equipped with diesel engines have recently completed very satisfactory test flights and a number of automobile buses and trucks are being driven with this form of power.

In addition to encouraging the wider use of this efficient prime mover, the manufacturers are also giving more attention to better diesel power plant design. Although the diesel engine is a very simple type of prime mover, its satisfactory operation depends on good plant layout. Cooling water and lubrication are especially important in this field, and the layout of cooling water systems has come in for considerable study. The use of lubricating oil purifiers of various types and the development of completely automatic lubrication systems have eliminated difficulties in this phase of plant operation.

With all of this increasing interest in diesel engines, the manufacturers through their Diesel Engine Manufacturers' Association are filling an important need in making all sorts of information available to the public with respect to diesel engines and their operation.

The following manufacturers are members of the association:

New London Ship & Engine Works, Electric Boat Co.

Worthington Pump & Machinery Corp.

Fulton Iron Works Co.

Ingersoll-Rand Co.

Fairbanks, Morse & Co.

Nordberg Manufacturing Co.

I. P. Morris and De La Vergne, Inc.

Winton Engine Co.

Cooper-Bessemer Corp.

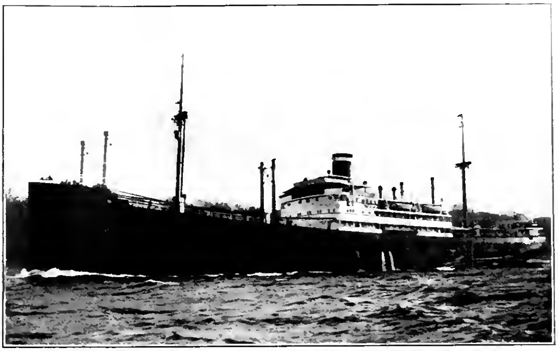
McIntosh & Seymour Corp.

Busch-Sulzer Bros. Diesel Engine Co.

Hooven, Owens, Rentschler Co.

The president of the association is Henry R. Sutphen, president of the Electric Boat Co.; E. T. Fishwick, vice-president of the Worthington Pump & Machinery Corp. is vice-president of the association; and Harlan A. Pratt, manager, Oil & Gas Engine Department of Ingersoll-Rand Co., is secretary and treasurer. The association also employs M. J. Reed as research engineer, with headquarters at the association office, 30 Church Street, New York City.

Efficient Insulation of Cold Storage Rooms



The Hamburg-American motorship San Francisco carries Torfoleum insulation in cold storage rooms.

IN the carrying of refrigerated freight aboard ship, one of the most important factors in efficiency of the insulation is thorough insulation of the cold chambers from any outside source of heat.

One of the most efficient materials known to marine engineering for this purpose is the prepared peat moss which is marketed under the trade name of Torfoleum and is distributed in the United States by Pennrich & Company of New York and on the Pacific Coast by Maillard & Schmiedell of San Francisco.

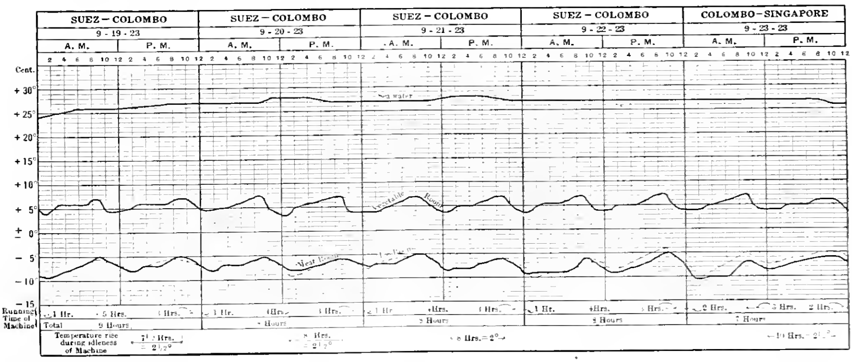
Torfoleum has many practical characteristics which make it ideal insulation for marine use. It is manufactured in sheets 19½ inches wide by 39 inches long, and in thicknesses from 1 to 6 inches. As compressed in these sheets, Torfoleum has a weight of less than one pound per board foot. It is easy of application, since it can be nailed and can be cut with a knife or saw; so that any carpenter can make a very neat job of applying this material.

Torfoleum is very durable. It does not rot and contains no bituminous or mineral binder; so that it provides permanent insulation not only against heat but against sound transmission. In texture it is dense with pores smaller than 0.004 inch in diameter, which is a highly important attribute in an insulating material. It is non-capillary and impregnated against water absorption, so that it can be safely used in moist conditions at sea. Its thermal conductivity on numerous tests has been found to be 0.27 B.T.U. per square foot per hour per one degree Fahrenheit temperature difference through one-inch thickness.

Torfoleum is a sterile material that will not harbor vermin. It is fire-retardent and may be used as a heat insulation up to 230 degrees Fahrenheit. It is free from odors that might affect foods in storage.

Torfoleum insulation is installed in the refrigerating rooms of many motorships of the Hamburg-American line and other companies. We reproduce herewith the graphical record of the performance of this insulation in assisting refrigeration in vegetable and meat cold storage rooms of the motorship Havelland. It is in use in the cold storage chambers of the motorships Los Angeles, San Francisco, Portland, and Seattle of the Pacific Coast-European fleet of the Hamburg-American Line.

Maillard & Schmiedell have assumed the business of W. W. Kirby, Inc., and the Pacific Insulation Company, previous distributors of Torfoleum. Under the management of W. W. Kirby this firm is prepared to render Pacific Coast-wide service to marine refrigerating plant operators through offices at San Francisco, Los Angeles, Seattle and Portland. Stocks are carried at San Francisco, Los Angeles, and Seattle.



Graphical record from recording thermometers on the motorship Havelland showing remarkable efficiency of Torfoleum insulation.

Electric Propulsion for River Tow Boats

A CONTRACT for the complete turbine electric propelling equipment for two 2000-shaft horsepower, twin-screw, tunnel-type towboats for the Standard Unit Navigation Company of St. Louis was recently awarded to Westinghouse Electric & Manufacturing Company. These towboats, when completed, will operate on the Mississippi River between St. Louis and New Orleans.

The propelling equipment of each boat comprises an impulse reaction Westinghouse turbine driving through a single reduction gear, two main generators and one exciter; a main condenser with attendant auxiliaries; two main propelling motors; and main and auxiliary switchboards providing for pilot house and engine room control.

The main turbine is of the same design as those now in successful operation on the recently commissioned turbine electric Coast Guard cutters, Chelan, Mendota, Pontchartrain, Champlain, and Tahoe. It operates at 250 pounds steam pressure at the throttle, with 200 degrees of superheat, and exhausts into a 28-inch vacuum. The single reduction gear has a ratio of 3,600:900.

The two main generators are each rated as 815 kilowatts, 600 volts, direct current machines and have a speed of 900 revolutions per minute. The exciter is a 110-kilowatt, 125-volt, direct-current machine, also operating at a speed of 900 revolutions per minute.

The two main propelling motors are each rated at 1000 shaft horsepower and operate at a speed of 185 revolutions per minute. They are double armature direct-current machines operating at 300 volts per armature. The motors will be installed with Kingsbury thrust bearings. Control will be provided from both the pilot house and engine room.

The main condenser has a condensing surface of 2500 square feet and will be equipped with air ejectors and electrically driven auxiliaries. Westinghouse will also furnish a 50-kilowatt, 125-volt auxiliary turbine generator set to supply power for the electrically driven auxiliary machinery.

A Convenient Source of Heat for Maintenance and Repair

PUBLIC utility corporations, whether they furnish gas, electricity, or telephones to vast communities, are all striving to give the best service they possibly can. Most people realize this fact and when a severe storm or other unusual circumstance disrupts this service they are always willing to bear with the utility company until the trouble can be located and repaired.

Most of us have observed the telephone maintenance men on the job immediately after a big storm. It may be that some poles are down or some wires are crossed or broken due to heavy winds or the weight of sleet. A hundred and one things may happen during a storm to disrupt the service. The damage is quickly located and repaired with modern tools and repair equipment which would make the old time "trouble shooter" stare in amazement.

For instance, a majority of the telephone companies have equipped their repair and maintenance crews with compact outfits, consisting of a small Prest-O-Lite tank containing 10 cubic feet of acetylene, a length of hose, a torch with various attachments, and a lighter. With these outfits all kinds of soldering, splicing, wiping, and similar operations on wire, cables, or switchboards are easily accomplished.

Similar outfits are also widely used by garages, battery repair stations, and for general shop work in industrial plants. For this type of work, the outfit is generally used with Prest-O-Lite tank having a capacity of 40 cubic feet of dissolved acetylene.

These tanks and torches make ideal outfits for many emergency repairs aboard ship at sea or on the pier.

There are several features which recommend these outfits: They get into action immediately. No preheating is necessary. Simply turn on the gas, light the torch, and the job is under way. The initial cost is moderate. They are economical and operate unfailingly in all kinds of weather.

When the flame is not in actual use it can be turned off and relit instantly when needed again. They offer a great range of flames for many different jobs. There are no delicate or complicated moving parts to get out of order or need replacement. Under ordinary care an outfit will last indefinitely.

More than 15,000 gas exchange stations scattered throughout the country are ready to exchange a full tank for an empty one.

REPAIR FACILITIES FOR TURBINE VESSELS PROVIDED AT TODD PLANTS.

INCREASED facilities for the handling of turbine repairs are being provided at the plants of the Todd Shipyards Corporation, New York Harbor.

Additional equipment of the most modern type is being installed. A dynamic balancing machine and machinery for the manufacture of impulse blading, in connection with impulse and reaction turbines, will be provided and a complete stock of material will be always available for emergency or other repairs.

For many years the Todd Shipyards Corporation has been a licensee for the manufacture of Parsons turbines, and its personnel has had long experience in all classes of turbine work. To make its turbine division of even greater value to the shipowner, C. C. Seigh, formerly of the Westinghouse Electric & Manufacturing Company, will have supervision over all turbine work and will make his headquarters at the main offices of the corporation at 25 Broadway, New York.

Mr. Seigh, for the past ten years, has been port engineer in New York with complete charge of installation and repair work on Westinghouse equipment on all merchant and naval vessels, equipped with turbines. During his twenty-three years of turbine experience, Mr. Seigh has been supervisor of installation and guarantee engineer in charge of sea trials, his duties including the installation on the steamship Maui, the first turbine geared unit in the American merchant marine. His work has taken him to most of the shipyards on the American seaboard and placed him in contact with the development of turbines from ½ horsepower to the modern 210,000 horsepower turbine of today.

Promotion for G. Harold Porter

Radio Corporation of America Honors Its Pacific Division Chief

THE host of friends he has made since coming to the Pacific Coast are congratulating G. Harold Porter, manager of the Pacific Division of the Radio Corporation of America, on his recent election to the vice-presidency of the R.C.A. Communications, Inc., and of Radiomarine Corporation of America, in charge of the Pacific Division activities of those corporations. Mr. Porter will continue to act as manager of the Pacific Division of the Radio Corporation of America.

Mr. Porter was born in Carbondale, Pennsylvania, in 1871. His recent promotions top an interesting and varied career which he began at nine years of age as a breaker boy in the mining department of the Delaware & Lackawanna Railroad. Progressing successively from newsboy, office boy, and messenger, young Porter became interested in telegraphy. After mastering all the information he could find on the subject, he was able to qualify as a telegraph operator. Seeking a wider field, he went to New York in 1890, where he found employment with the Kings County Railroad, and later with the Central Railroad of New Jersey. Shortly after, he joined the Baltimore and Ohio Railroad

G. Harold Porter, manager of Pacific Division of Radio Corporation of America, who has just recently been elected to the vice-presidency of R.C.A. Communications, Inc. and of Radiomarine Corporation of America. Continuing as manager, Pacific Division of the Radio Corporation, Mr. Porter will now also have charge of Pacific Division activities of the two subsidiaries.

Company, and was soon placed in charge of the New York operating division. In 1898, he was made chief clerk of the general freight department. In 1906, Mr. Porter joined the Tyler Lumber Company as traffic manager, and a year later was made secretary of the company.

Mr. Porter began his radio career in 1913 with the Marconi Wireless Telegraph Company, and one of his first assignments was the task of purchasing the entire equipment for the erection of high-power radio stations in California, Alaska, Hawaii, Massachusetts, and New Jersey. His marked ability in this work led to his appointment as purchasing agent. Three years later Mr. Porter was made assistant commercial manager.

With the formation of the Radio Corporation of America, which absorbed the Marconi Company in 1921, Mr. Porter was made general superintendent of the marine division. As the business of the corporation rapidly increased on the Pacific Coast, Mr. Porter was chosen to assume the duties of manager of the Pacific Coast division.

Clean-cut executive qualities, combined with a willingness to go the limit in friendly service, have built up a very cordial respect and admiration for G. Harold Porter on the part of ship operators on the Pacific Coast, and the marine fraternity are united in their expressions of hearty good will as he takes on these additional responsibilities.

Trade Literature

Worthington Pump and Machinery Corporation, Harrison, New Jersey, has issued a new catalog on Worthington Axiflo, Hiflo, Coniflo deep well pumps, Bulletin D-450 B-1. The booklet describes in detail the construction and application of each of the three types of pump and contains numerous illustrations and tables of flow of water through pipes, horsepower required, etc.

Westinghouse Electric & Mfg. Company, East Pittsburgh, Pennsylvania, has recently published an interesting leaflet on **Modern Auxiliary Power and Lighting Equipment,** stressing the importance of electric power in industry.

Other literature of interest to the marine field which is now ready for distribution by Westinghouse is as follows:

No. A-06365. Catalog on **Fittings for Pipe Structures.** This is a complete revision of the old leaflet and includes many new applications for these pipe fittings, such as racks in industrial establishments, railings, display racks, and pipes of all kinds. It is well illustrated with photographs and drawings.

No. A-06358. Leaflet describing **Type A Direct-Current Drum Controllers,** giving the application, distinctive features, operation and construction of these controllers, profusely illustrated. These drum controllers are used for operating cranes, hoists, turntables, bending rolls, and the like.

No. A-06363. **400-Ampere Single Operator Welder** is the subject of an illustrated leaflet, describing this single-operator welding set for portable and stationary use.

Marine Oil Engines for direct and electric drive is the title of a catalog just issued by **Ingersoll-Rand Company,** 11 Broadway, New York.

This is a very beautifully printed and illustrated exposition of the numerous applications of Ingersoll-Rand marine engines in all types and sizes of craft. There have been in the past few years a number of successful installations of these engines in freighters, tankers, ferryboats, and towing vessels and these are described in the present catalog.

Quimby Marine Pumps are de-

scribed and illustrated in Bulletin 6200, which is available on application to the Quimby Pump Company, Inc., 340 Thomas Street, Newark, New Jersey.

Commerce Yearbook for 1929, Volume I, is now ready for distribution from Superintendent of Documents, Washington, D.C. Price $1.00.

The Commerce Yearbook is issued annually by the Department of Commerce, and constitutes a complete and authentic record of the latest developments in trade and industry. It is an invaluable source of reference for business men, foreign traders, shippers, bankers, economists, and students. Volume I deals with the United States, its territories and possessions, and contains full statistical data for the calendar year 1928. Volume II, which will be available about October 1, will cover all foreign countries.

Elwell-Parker Tructors are the subject of a fine new catalog just issued by The Elwell-Parker Electric Company of Cleveland, Ohio.

Elwell-Parker electric storage battery industrial trucks, tractors, and cranes are designed and built for every need of interdepartment and warehouse and storage hauling and stacking services, and these are supplied in standard and specialized units. The catalog contains 39 pages, is printed on fine coated stock, and is profusely illustrated with fine photographs of the tructors and their working parts, as well as actual scenes in warehouses and industrial plants with the tructors in use. Complete specifications accompany all descriptions.

Copies of the catalog will be sent free to any one addressing Ira G. Perin, distributor for Elwell-Parker, 200 Davis Street, San Francisco, or the head office at Cleveland.

General Electric Company, Schenectady, N.Y., has ready for distribution the following leaflets:

GEA-876C—Type WD-400A Arc Welder;

GEA-752A—Direct Current Motors, Type BD;

GEA-571C—G-E Arc-Welding Accessories;

GEA-724B—Totally enclosed, fan-cooled squirrel-cage motors, "900 Series" frames;

GEA-1009A — General Electric Type WD-300A arc welder, Buda gas engine-driven;

GEA-416B — CR7051 Automatic starting compensators.

Submarine Signal Fathometer for Visual Echo Soundings is a little booklet just issued by the Submarine Signal Corporation, 160 State Street, Boston, and ready for free distribution on request.

The book is nicely bound with cardboard and is well printed, edited, and illustrated. It covers under general chapter headings the complete story of this wonderful aid to navigation — the Fathometer—the chapter headings being Development, Adaptability, Principles of Operation, Installation, Advantages and Comments.

This valuable instrument to modern navigation has been receiving world-wide recognition and favorable comment. The exceedingly satisfactory performance of the Fathometer on the new steamer Bremen indicates fully the adaptability of visual echo sounding to ships operating at great speed in transoceanic service.

The Cooper-Bessemer Corporation is distributing to the trade a new bulletin covering the **Cooper Type-16 Compressor Unit.**

According to the builders, the Cooper Type-16 compressor unit is really something new in engine building, and of particular note are its gas to diesel conversion feature, its direct driven compressor cylinder, and its self-contained engine and compressor design. The bulletin is well illustrated with actual installation photographs, as well as catalog photos of the units and their individual parts.

Monel Metal Shafts and Brightwork. This is a new bulletin issued by the International Nickel Company of 67 Wall Street, New York, and is of particular interest to designers, builders, and owners of pleasure craft. For strength, beauty, durability, and service, Monel Metal offers a wide variety of uses for the boat owner who seeks the utmost in refinements, appearance, and performance in his craft. This little booklet of 11 pages gives examples of the many uses for monel metal on small craft and will be distributed free on request.

Burmeister & Wain, Ltd., engineers and shipbuilders of Copenhagen, Denmark, have just published the record of their accomplishments in a book entitled **The Shipyards 1929.** This is an excellently printed and illustrated booklet of 90 pages, printed on heavy coated stock, and bound in stiff paper cover. The book portrays the plant and equipment of the two shipyards maintained by the company and the vessels and engines produced there, giving particulars of many types.

American Marine Standards Committee, Washington, D.C., has prepared the following leaflets relative to standard equipment promulgated for American ships, and all of these may be obtained from the Government Printing Office. Price 5 cents:

AMSC 50—Fittings for Tubular Steel Cargo Booms;

AMSC 52—Medcial Equipment for Ocean-Going Vessels;

AMSC 53—Medical Equipment for Coastwise and Lake Freighters;

AMSC 54—Medical Equipment for Small Vessels;

AMSC 55—Ship Propellers;

AMSC 56—Ship Scupper and Drains;

AMSC 58—Lifeboat Disengaging Apparatus;

AMSC 59—Rat Proofing of Ships;

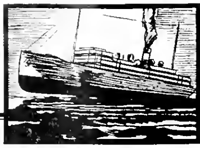
AMSC 62—Marine Boiler Steel Plates.

Trade Note

As a result of patent conflict, the Liquid Carbonic Company, owners of the Fyre-Freez Corporation, entered into an agreement with **Walter Kidde and Company, Inc.,** whereby, in settlement of such claims, the Fyre-Freez Corporation has been reorganized under the name of **Fyre-Freez, Inc.,** and will continue under a license from Walter Kidde and Company, Inc., to market portable fire extinguishing equipment as licensee.

As the Fyre-Freez, Inc., will not be licensed under Lux-Rich patents in the marine applications, the Walter Kidde and Company, Inc., have agreed to carry out the existing contracts for Fyre-Freez and Marr devices.

Walter Kidde and Company, Inc., have taken over the applications for patents which are pending and the use of the name "Marr."



Marine Insurance

Edited by JAMES A. QUINBY

Fireman's Fund Changes Personnel

EFFECTIVE the first of this month, general orders for change of station have altered the destinies of several ranking officers in the marine department of the Fireman's Fund Insurance Company. George Jordan, erstwhile assistant marine secretary of the company at its home office in San Francisco, is transferred to New York as manager of the Atlantic Marine Department, succeeding Chas. R. Page. Mr. Page comes west to join the head office staff in San Francisco. Leslie J. Haefner succeeds to the post formerly held by Mr. Jordan in the western organization.

These changes promise to have a far-reaching effect upon the personal complexion of things maritime on both sides of the continent. The Fireman's Fund and its allied companies, the Home Fire & Marine and the Occidental, have long exerted an influence second to none on the Pacific Coast. Of late years their sphere of influence has increased on the Atlantic seaboard to achieve a position well up among the leading maritime underwriters in New York. Much of this eastern prestige has been due to the ability and outstanding personality of Charles R. Page, who left the home office in 1917 to assist the government through those difficult war years as a United States Shipping Commissioner at Washington. After the Armistice, Mr. Page returned to the company, taking over the post of marine manager in New York. The directors of the firm last year recognized his meritorious service by elevating him to the position of vice-president.

Charles R. Page, vice-president of the Fireman's Fund Insurance Company.

George Jordan, newly appointed manager of the Atlantic Marine Department, Fireman's Fund Insurance Company.

The Pacific Coast will lose heavily by the transfer of George Jordan to New York. Coming to the Fireman's Fund twenty years ago, with London and New York experience already behind him, his dynamic personality has led him to a position of dominance in the Pacific Coast marine market. His position on the Adjustment Committee of the Board of Marine Underwriters has been due as much to his own ability as to the power of the company he represents. His gift for crisp, aggressive decision has endeared him to the marine fraternity of the West Coast, who will miss the Little Napoleon of California Street. We hope he follows the steps of his predecessor, and returns home in the near future, covered with greater glories, to assume his old position as a typical Westerner.

Mr. Haefner's promotion will be popular with his many friends on the Coast. His underwriting experience with the Fireman's Fund began twenty-three years ago, and progressed under the able tutelage of Marine Secretary, A. W. Follansbee. The strictly underwriting end of the marine department has been under his direction for some years, and his accession to the post of assistant marine secretary is a natural and well-merited one.

Leslie J. Haefner, newly appointed assistant marine secretary of the Fireman's Fund Insurance Company.

Fire Statute Explained

A NEW light on the fire statute and limitation statute is found in the case of the Etna Maru, reported at 1927 A.M.C. 1142, and affirmed by the 5th Circuit Court of Appeals at 1929 A.M.C. 1119.

While the vessel was loading sulphur at Galveston, a weight of about 300 tons of this material was placed on a hatch cover which was in place over a hatch leading into the lower hold. Due to a defective clip supporting a strongback, this hatch cover gave way, dropping the sulphur into the hold and causing an explosion and fire, resulting in damage to the cargo.

The cargo owner filed a libel in rem and seized the vessel. In the District Court, the owners showed that the customary certificates of inspection and seaworthiness had been obtained prior to loading, but the court points out that the inspection thus shown was of the most cursory character so far as the hatch in question was concerned. As a result, the court found that the vessel was unseaworthy at the beginning of the voyage, and that the unseaworthiness could have been discovered by the reasonable exercise of due diligence.

The vessel owners relied upon the so-called Fire Statute (Revised Statues 4282) exempting a shipowner from liability for fire occurring on shipboard unless caused by his design or neglect. In the present case, the Limitation Statute, enabling a shipowner to limit his liability to the value of his vessel, was not involved, since the value of the vessel after the fire exceeded the claims against her.

The lower court held against the owner on the ground that his contract with the charterer contained an express warranty of seaworthiness, which precluded his reliance upon the fire statute.

The appellate court disregards this reason as unimportant, and, after an examination of the facts and the fire statute, holds that the latter is designed to protect the **owner** but not the vessel. This conclusion is reached by treating the fire statute and the limitation statutes as mutually dependent, which the court does in the following words:

Limitation and Fire Statutes on Same Basis?

"The statute relied on was part of the Act of March 3, 1851, carried into the Revised Statutes as Sec. 4282, 4283 et seq. (46 Mason's U. S. C. 182, 183, et seq.). These sections are designed to modify the common law liability of a ship owner, not only as to losses caused by fire but also by collision and other accidents. They are **in pari materia** and must be construed together. They were not intended to, and do not entirely excuse an owner for loss by fire in every event, even though not caused by his own design or negligence. This is tersely and clearly stated by Mr. Justice Bradley in Railroad Co. vs. Lockwood, 84 U. S., pp. 357-361, where he said, referred to the act of 1851, and discussing limitation of carrier's liability generally: 'though intended for the relief of the shipowner, it still leaves him liable to the extent of his ship and freight for the negligence and misconduct of his employes, and liable without limit for his own negligence.' See also Walker vs. Transportation Co., 70 U. S. 150; Norwich Co. vs. Wright, 80 U. S. 104; Providence & N. Y. Steamship Co. vs. Hill Mfg. Co., 109 U. S. 578.

The authorities are unanimous that in all contracts of affreightment there is an implied warranty of seaworthiness at the beginning of the voyage. Caledonia, 157 U. S. 124; Carib Prince, 170 U. S. 655; Carver, Carriage of Goods by Sea (7th Ed.), sec. 17.

Appellant argues that unseaworthiness is not a factor to be considered in exemption from liability under the Fire Statute.

The cases mainly relied upon by appellant, to-wit: Virginia Carolina Chemical Co. vs. Norfolk & North American Steam Shipping Co. (1912) 1 K. B. 229; (1913) A. C. 52; and Ingram & Royle, Ltd. vs. Services Maritimes du Transport (1914) 1 K. B. 541, construing a similar English statute, sec. 502 of the Merchant Shipping Act of 1894; also Strathdon, 89 Fed. 374, affirmed on appeal, 101 Fed. 600, are not persuasive in support of this argument. In each of these cases the owner was sought to be held personally liable and in each the vessel was found to be seaworthy at the beginning of the voyage. Limitation of liability to the value of the vessel and freight was allowed in each case, but the presumption may be indulged, from the tenor of the opinions, that had the ship been found unseaworthy at the beginning of the voyage, the decision would have been to the contrary. But in any event, these authorities are not in point.

The conclusion we reach is that regardless of whether appellant is bound by the expressed warranty of the charter to the extent that it may not limit its liability at all, or whether it has been guilty of negligence personally, it is certain that the unseaworthiness of the vessel at the beginning of the voyage amounted to negligence of either itself or its employees. There is nothing in the statute to bar a recovery against the ship. Richardson vs. Harmon, 222 U. S. 96; Capitol Transp. Co. vs. Cambria Steel Co., 249 U. S. 334; Malcolm Baxter, Jr., 277 U. S. 323, 1928 A. M. C. 960.

The record presents no reversible error. Affirmed."

If this language successfully places the fire statute on the same basis as the limitation act, it deprives the shipowner of one of his most valuable absolute defenses. The fire statute is rendered null and void in all cases where the vessel retains a value in excess of the claims made against her. All the claimant need do is to libel in rem, and our friends from the 5th Circuit will conclude that "there is nothing in the statute to bar a recovery against the ship."

In our humble opinion, the artificial dissociation of ship and owner was never anticipated by either of the statutes. The case does not look to be sound.

Drums of Jeopardy

San Francisco,
August 1, 1929.

Mooseville Varnish Works,
Mooseville, California.

Gentlemen: We understand that you have on hand a number of casks or drums suitable as containers for oil or varnish. We have at San Francisco some damaged wood oil which arrived on one of our vessels, and would like to obtain ten (10) of these drums in order that the oil in the damaged drums may be transferred to the new containers.

Due to our long and friendly relations we thought immediately of applying to you for assistance.

Yours truly,
Panama Dispatch Steamship Co.
By M. M. McCarthy,
Operating Manager.

Mooseville, California,
August 4, 1929.

Panama Dispatch Steamship Co.,
San Francisco, California.
Attention: Mr. McCarthy.

Gentlemen: We are in receipt of your favor of August 1 requesting that we send you ten (10) drums for wood oil. We are shipping these drums to you immediately and are very glad to be of service. The drums usually sell for $1.68 per drum, but in view of our long and friendly relations, we are sending you these drums at a price of $1 each. Our bill in the amount of $10 is therefore enclosed.

As a matter of interest, the writer notes that your Operating Manager's name is McCarthy. This is quite a coincidence as the writer's name is also McCarthy. This, we believe, is symbolic of the long and friendly relations which have existed between us.

Yours truly,
Mooseville Varnish Works.
By O. P. McCarthy.

Mooseville, California,
September 1, 1929.

Panama Dispatch Steamship Co.,
San Francisco, California.
Attention: Mr. McCarthy.

My dear Mr. McCarthy: This is just another little personal note from the writer who has the same name as your own. Don't you think this is quite a coincidence? It doubtless reflects the long and pleasant business relationships which have existed between our two firms.

By the way, Mr. McCarthy, there is a little matter of a $10 bill which we sent some time ago for ten (10) drums which we were kind enough to furnish you when you needed same. No doubt this has been overlooked, and we trust that our long and pleasant relationship will not be affected by further delay in settlement.

Fraternally yours,
O. P. McCarthy.

San Francisco, California,
September 5, 1929.

Mooseville Varnish Works,
Mooseville, California.

Gentlemen: We were greatly surprised to receive your letter of the first instant. We neglected to tell you that the wood oil for which we needed additional drums was your own wood oil which was being shipped on one of our vessels. In view of this circumstance, we were naturally acting for your best interest in endeavoring to preserve your shipment and cannot, of course, meet any bill for extra drums as these drums were obtained and used exclusively for your benefit.

We trust that this explanation will clear up matters and that our long and pleasant business relationship will continue. Assuring you of our appreciation of your patronage, we are,

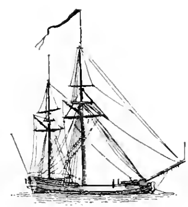
Yours truly,
Panama Dispatch Steamship Co.
By M. M. McCarthy,
Operating Manager.

(Wire, Collect.)
Mooseville, California.
September 6, 1929.

M. M. McCarthy,
c.o. Panama Dispatch Steamship Co.
San Francisco, California.

Kindly change your name immediately and oblige.

O. P. McCarthy.



THE RE-INSURERS OUT OF LUCK IN TEXAS

WE have so long been accustomed to think of re-insurers as safe from claims until after the original insurer has paid that we read the decision of the Supreme Court of Texas in the case of R. Waverley (1929 A.M.C. 1193, affirming 1928 A.M.C. 1049) with considerable surprise.

One C. J. Dick insured a vessel with the General Anglo-Mexican Insurance Company, which latter company re-insured with the Home Insurance Company and the Franklin Fire Insurance Company. The vessel was destroyed by fire in the harbor of Tampico, Mexico, and Dick returned to Texas, where he later filed suit against the Mexican company to recover under his policy. As the Mexican company had no agent in Texas, jurisdiction was obtained by publication as provided by the statutes of Texas and the case proceeded. The assured also sued out writs of garnishment against the two re-insurers, who were doing business in Texas.

The District Court rendered judgment against the Mexican company for the full amount of the coverage and against each of the garnishees for one-half that amount. This judgment was affirmed by the Court of Civil Appeals and is now affirmed by the Supreme Court of Texas.

The original policy bore a provision requiring that suit for the recovery of claims thereunder must be filed within one year from the date of damage. This was not done, but the court held the defense not available to the insurer, as the time limit thus set was not in accord with the time statute of Texas. In this regard, the state courts of Texas are taking an attitude similar to that of the New York state courts in regard to time limitations for suit contained in bills of lading.

The most interesting point of the case, however, was the contention of the re-insurers that since no judgment was collectible from the original insurer, no liability rested upon the re-insurers and that consequently the garnishment process should fail. The court ruled against this contention and allowed recovery directly from the re-insurers.

This decision is directly contrary to the text-book theory that no direct liability exists between the original insured and re-insurers. Suit against an absent original insurer as a figurehead, and garnishment against re-insurers achieves a direct liability by means of subterfuge. We doubt if this case will be followed by our federal courts, but it is apparently firmly established in Texas.

MIXED CARGO

October 15 will see the retirement from active service of Willis D. Benson, Pacific Coast manager for the Transmarine Lines. His place in San Francisco will be taken by Captain C. L. Meek, former district manager for the line in Seattle. Captain H. M. Sorenson, erstwhile port superintendent for the company at Aberdeen, will have charge of the Seattle office.

The Transmarine organization, which has attained a front-rank position among the intercoastal carriers since the war, owes much of its prestige on the Pacific Coast to the ability and tireless effort of Mr. Benson, who has held his present position with the line since 1923.

Things I have learned during office hours:

That spring fever may occur at any season.

That an envelope marked "Personal," and bearing a simple office number as a return address, probably contains a real estate advertisement.

That I should never, never talk to insurance brokers immediately after lunch, when I am in a kindly mood.

That honesty is the best policy, but all policies aren't necessarily honest.

That many an engraved personal card hides a book agent.

That Monday is the longest day of the week.

That it's not good business to bid no trump on two aces and a guarded jack.

The opposing attorney glared at the skipper who was on the witness stand.

"And so," he thundered, "your vessel was making ten knots in the fog. Is that a proper speed?"

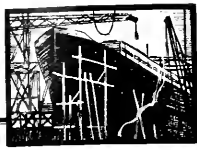
"No, sir," said the cap'n, earnestly, "but she can't go any faster."

Notorious last words: "Your attitude toward this claim will seriously affect our attitude toward a renewal of our policy."

PARSON'S WHITE BRASS

C. V. Lane of San Francisco has recently been appointed Pacific Coast representative of the Cramp Brass and Iron Foundries Company of Philadelphia to handle its famous Parson's White Brass. This metal has been long and favorably known to marine engineers who will now be glad to know that a stock will be carried in San Francisco for immediate delivery.

Approximately 8 tons of Parson's White Brass was used in the recent remetalling of all bearings on the steamship George Washington.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

MANY ORDERS BEING PLACED FOR PACIFIC COAST PLEASURE BOATS.

Plans have been announced through a Los Angeles source for the construction of a 180-foot steel cruiser for G. Allan Hancock of Los Angeles. G. Bruce Newby, well-known naval architect, of Los Angeles, will draw up the plans and supervise construction and engineering work. It is reported that the vessel will be built in a Los Angeles Harbor shipyard.

Durability will be stressed in the construction of the planned new cruiser, which will embody the latest of modern equipment. She will be powered by a diesel engine and will have a cruising radius of about 10,000 miles and speed of 14 knots.

G. Allan Hancock is well known for his intense interest in scientific investigations and encouragement to marine and transportation advancement. He was the backer of the successful transpacific flight of the airplane Southern Cross from Oakland to Australia. He is the owner of the yacht Volero II. and was formerly owner of the steamer Oaxaca, which he used in trade to Mexico and also in long cruises for scientific observations.

Order for the power plant for this yacht has been placed with the Winton Engine Company through Frank G. Bryant, Los Angeles representative. The following equipment has been ordered:

Two Winton Model 128A, 850 brake horsepower, 250 revolutions a minute, 17-in. bore, 26-in. stroke, air injection, directly reversible diesel engines; two Winton Model 144, 75 kilowatt, airless injection oil generators; one Winton Model W2A, 7½-kilowatt gasoline engine driven generator complete with radiator, switchboard, and gasoline tank, for emergency service; two Winton Model 118, 10-horsepower motor driven air compressors; one Winton Model 126, 10-horsepower motor driven fire and bilge pump; one Winton Model 127, 2-horsepower motor driven sanitary pump; and one Winton standard equipment.

This is said to be the largest order for diesel engine and equipment for a pleasure boat ever placed on the Pacific Coast.

According to reports from the Northwest, W. E. Boeing, of Seattle, is figuring on building a 120-foot steel, diesel powered, cruiser at the Vancouver, British Columbia, plant of the Hoffar-Beeching Marine Construction Co., Ltd. It is reported that the shipbuilding plant has been merged with the Boeing interests and is known as the Boeing Aircraft of Canada, Ltd.

L. A. Norris, well known San Francisco yachtsman, is said to have retained L. E. Geary, naval architect of Seattle, to draw up plans and specifications for a 120-foot steel yacht which will be designed for extensive ocean cruising and will be fitted with a 275-horsepower diesel engine.

The Craig Shipbuilding Company, Long Beach. California, has just laid the keel for the building of a fine 120-foot, twin-screw, diesel-powered yacht for John Barrymore, the actor, of Los Angeles. The yacht is designed by L. E. Geary of Seattle and will be fitted with all modern devices for safety of navigation and comfort of travelers in extensive sea voyages. An order for two Atlas-Imperial diesel engines of 275 horsepower has been placed for the propulsion plant.

Loan Granted for Ship Construction

The U. S. Shipping Board has approved a loan of $6,675,000 under the Merchant Marine Act, 1928, for the Export Steamship Lines of New York. This company, headed by Herbert Hebermann, has offices at 25 Broadway, New York. It operates the American Export Line between Atlantic Coast ports and ports of Mediterranean.

Order for these four vessels has been placed with the New York Shipbuilding Company, Camden, New Jersey, aggregating a cost of $8,900,000, the loan advanced by the government being three-quarters of the estimated cost.

In connection with the announcement made at Washington concerning this loan, it was further stated that the American Export Steamship Corporation proposes to build eight more ships of a type similar to the four for which contracts have already been placed within seven or eight years.

The vessels are to be 450 feet between perpendiculars, 61 feet 6 inches breadth, 33 ft. 3 in. depth molded to second deck, of all steel construction. The propelling engines are to develop 6300 shaft horsepower on a single propeller and to develop a loaded speed of 14 knots.

New River Boat for Columbia

C. H. Shaver of Portland, Oregon, is said to be planning the construction of a 100-foot freight vessel for operation between Portland and The Dalles, and that the machinery for the vessel is already available.

New Salvage Equipment for San Pedro

Plans to augment the service fleet at the Port of Los Angeles and make it as adequate and modern as the facilities of any port in the country were announced at the New York offices of Merritt-Chapman & Scott Corporation through William Baker, president.

Designs for a steel hull floating derrick of the newest type, capable of hoisting 90 tons overside are now being completed by the company's naval architects, and bids will be asked shortly from Pacific Coast shipyards.

Towboats for Inland Waterways

All bids opened on July 31 were rejected, and tenders based on a somewhat modified offer submitted by the Advisory Board of the Inland Waterways Corps were opened August 20.

New Tugboats for Dominion

Two single-screw seagoing steel tugs are to be built for the Canadian Department of Public Works, Ottawa, for work in the lower St. Lawrence River and the Gulf. The dimensions are: Length between perpendiculars, 94 feet; molded breadth, 23½ feet; draft, 10 feet. The hull is to have four water-tight bulkheads. The power plant of each boat will consist of compound, surface condensing steam engine with a steam working pressure of 140 pounds per square inch to turn 125 revolutions a minute. Two Scotch marine boilers will supply steam at 150 pounds per square inch pressure.

United States Lines Submits Tentative Plans for Two Liners

Tentative plans for the construction of two de luxe, high speed passenger liners for the United States Lines as running mates for the Leviathan have been submitted to the Shipping Board. The plans for the two vessels are being formulated under the leadership of Theodore E. Ferris of New York, who has as consultants the naval architects from the leading shipyards of the Atlantic Coast. According to proposed plans, the two new vessels will have a length of about 900 feet and speed between 27 and 28 knots. Geared-turbine and turbo-electric drive are being considered for the propulsion power. It is hoped that a definite approval of the general plans may be reached within the next sixty days; so that orders may be placed in the spring of next year.

New Coastwise Tankers

It is reported from the East Coast that the Standard Shipping Company of 26 Broadway, New York, a subsidiary of the Standard Oil Company (N. J.) is planning the construction of several self-propelled tank barges for coastwise service.

Diesel-Engine Powered Vessel Planned

The Kerr Steamship Company, Inc., of New York, is reported to be planning the construction of a diesel-powered passenger and freight steamer, although particulars of the plans are not yet made public.

Towboat for Inland Waterways

The Inland Waterways Corporation, Room 1016 Munitions Building, Washington, D.C., opened bids July 31 for the construction of two towboats for the upper Mississippi River.

Towboats for New York Company

James K. Ingham, consulting engineer, 152 West 42nd Street, New York City, is said to be preparing plans for the construction of two towboats for the Hedger Transportation Company of 25 Broadway, New York. This company is engaged in the transportation of freight by barge from New York to Great Lakes ports.

Bids Submitted for Survey Vessel

The United States Army Engineers at Philadelphia opened bids recently for the building of a 105-foot diesel-electric survey boat.

Charleston Drydock & Machinery Co. was low bidder at $181,328 for Ingersoll-Rand Engines and General Electric Motors and $181,800 for Lombard engine and General Electric motors.

Manitowoc Shipbuilding Corp. submitted next low bid of $181,800 and $182,800 for Lombard engines and General Electric motors.

Albina Marine Iron Works submitted next low bid of $192,546 for Nelseco or Ingersoll-Rand engine and General Electric or Westinghouse motors.

Fish Boat Ordered

Anderson & Cristofani, San Francisco, have received an order for a 50-foot sardine lighter for Monterey fisherman. This yard also has under construction several pleasure boats for San Francisco sportsmen for bay and outside cruising.

New York Ferryboat Order Placed

Todd Dry Docks Engineering and Repair Corp., Brooklyn, N.Y., has been awarded contract for construction of a steel ferry steamer for the City of New York. The boat will be 151 feet long, 53 feet width, 14 feet depth, powered with compound steam engines and oil-burning boilers. The boat will be a duplicate of the Yorkville, delivered this spring.

Bids submitted were:

Todd company, $395,641.

J. W. Sullivan & Co., $408,500.

United Dry Docks, Inc., $420,000.

Diesel Towboat for New York

Another diesel tug for the New York harbor fleet will be a diesel engine powered towboat for the Oil Transfer Corporation, 17 Battery Place, New York, to be similar to the tug Hustler and equipped with a 600 horsepower engine. D. I. Whittelsey is president and naval architect of the company.

Passenger Vessels Planned

The Hudson River Night Line, of New York, carrying passengers and automobiles between New York and Cleveland and Detroit, is reported to be preparing plans for two motor vessels to supplement this service. Col. E. C. Carrington is president of the company.

Dollar Company Expands

The Dollar Steamship Company of San Francisco has recently formed the Dollar Steamship Lines, Ltd., incorporated under the laws of the State of Delaware, with an authorized capital stock of $100,000,000, and propose to include all the holdings of the Dollar interests. R. Stanley Dollar, vice-president and general manager of the Dollar Steamship Company, will be head of the new concern.

In its extensive expansion of American shipping round-the-world, the Dollar Steamship Company has acquired extensive terminal and agency holdings in foreign countries, in addition to its large fleet of passenger and freight vessels operating under the American flag. An extensive shipbuilding program is planned under the provisions of the Merchant Marine Act, 1928.

One of the latest developments of this company in perfecting its organization for Class-A service to its shippers is a $2,000,000 radio system which will encircle the globe and enable all vessels and agencies of the system to be in constant communication. Five transmitting stations of 15,000 watts each are being constructed at Honolulu, Manila, Shanghai, and New York. The San Francisco station is now in operation. Simpson Radio Corporation patents have been purchased by the Dollar interests, and the new system will be installed under supervision of Fred G. Simpson, the inventor.

Urges American-Flag Fleet for European Trade

On his recent visit to Pacific Coast ports for the purpose of studying shipping interests and to better his acquaintance with Pacific Coast problems, Shipping Board Commissioner Jefferson Myers took many occasions to urge the inauguration of a fleet of fast motorships to carry Pacific Coast perishable cargoes under refrigeration to ports of Europe, and expressed regret that this lucrative trade is being eagerly sought by foreign lines exclusively.

Current American Shipbuilding

On July 1, 1929, American shipyards were building or under contract to build for private shipowners 174 steel vessels of 150,782 gross tons compared with 182 steel vessels of 252,745 gross tons on June 1, 1929, according to the Bureau of Navigation, Department of Commerce.

There were 44 wood vessels of 19,080 gross tons building or under contract to build for private shipowners during the same period compared with 43 wood vessels of 15,480 gross tons on June 1, 1929.

REPAIRS

Los Angeles Shipbuilding & Drydock Company, San Pedro, on a low bid of $30,750 and time of 35 days, has been awarded a contract by Harry W. Goodall, with offices in the Russ Building, San Francisco, for the reconditioning of the 165-foot steel yacht Wenenah, which he recently purchased in Seattle. She will be converted from a coal to oil burning steamer.

This yard has also received contract for repairs to the main section of the Dutch motorship Bingtang, Java-Pacific Line freighter which went ashore in August at Long Beach. The work will cost $19,512.

Other bids submitted were by Bethlehem Shipbuilding Corp., $22,245; and Moore Dry Dock Co., $23,335.

The freighter Golden Forest of the Oceanic & Oriental Navigation Company, San Francisco, ran ashore early in August near Akutan in the Aleutian Islands. The Pacific Salvage Company of Victoria has sent the tug Salvage King to perform temporary repairs to enable the ship to reach Seattle. It is reported that the shell plating is bent and broken and for 30 feet on the starboard side there are small rips and dents.

United Dry Docks, Inc., of New York was low bidder for refitting 10 freighters of the American Scantic Line of New York and building into each vessel accommodations for 50 passengers. The bid was $1,357,725 and 65 days for the entire job.

TRADE NOTE

Chas. Cory & Son, Inc., has announced the opening of a new and spacious office and warehouse at 224-232 Spear Street, San Francisco.

NEWPORT NEWS DELIVERS CONVERTED SHIPPING BOARD FREIGHTER.

The work of reconditioning the steamship Ward and converting the vessel into a motorship has been completed at the plant of the Newport News Shipbuilding and Dry Dock Company, and the vessel was delivered to the U.S. Shipping Board on July 29.

This is the sixth of the fleet of eight ships selected by the Shipping Board in the extension of its diesel program. Two vessels have been converted by the Federal Shipbuilding Company, two by the Maryland Dry Dock Company, and work on two is still under way at the latter plant. Work on the motorship City of Elwood was completed at Newport News on June 11.

The general data and characteristics of this new addition to the motorship fleet are as follows:

Length over-all, 411′ 9″.

Length between perpendiculars (A.B.S.), 395′ 6″.

Beam molded, 55′ 0″.

Depth molded at side to shelter deck, 34′ 11″.

Normal mean load draft, 27′ 0¼″.

Displacement at normal mean loaded draft, tons, 13,141.

Gross tonnage, 6203.

Net tonnage, 3822.

Deadweight carrying capacity at this draft, tons (approx.), 9400.

Capacity of I.B. fuel oil tanks, tons, 1016.

Normal speed service conditions, knots, 12.3.

Comfortable and well-furnished quarters have been added for the accommodation of 14 passengers. All rooms and bathrooms have running fresh hot and cold water to basins and showers. An attractively appointed combination dining saloon and lounge is located adjacent to the staterooms.

The main engine is of the single-acting, 2-cycle, air-injection type, manufactured by Busch-Sulzer Bros. Diesel Engine Co. There are 6 cylinders with 30-inch bore and 52-inch stroke, developing 3950 brake horsepower at 104 revolutions per minute. Two independent blowers made by the Nordberg Manufacturing Company furnish scavenging air. The two auxiliary engines made by the Nordberg company are of the single-acting, 2-cycle, air-injection type, with three 17 x 23-inch cylinders. Each engine develops 500 brake horsepower at 200 revolutions per minute and drives a 340-kilowatt Elliott generator. The starboard engine is also connected through a magnetic clutch to a 550 cubic feet Nordberg emergency and manoeuvering compressor.

The waste heat from the exhaust is used to develop steam in a water-tube boiler manufactured by the Foster-Wheeler Corp.

Engine room and deck auxiliaries are motor driven. There are 10 cargo winches made by the Hyde Windlass Company, each driven by a Westinghouse 25-horsepower motor, with quick make and break type controller and Cutler-Hammer shoe-brake.

The vessel has been assigned to the American Pioneer Line operated for the U.S. Shipping Board by the Roosevelt Steamship Company.

WORLD SHIPBUILDING FOR THE LAST TWO YEARS

TABLE OF COMPARISON

	Quarter Ended Jun.30, 1929	Quarter Ended Mar.31, 1929	Quarter Ended Jun.30, 1928	Average Quarter For 1928
Gr.Britain & Ireland	1,453,906	1,357,375	1,202,610	1,244,001
Germany	272,444	406,982	407,534	414,318
Japan	179,968	147,010	111,325	105,234
Holland	172,406	163,856	173,190	177,420
France	139,316	155,351	125,984	132,351
Russia	124,908	116,388	115,298	104,108
UNITED STATES	119,098	96,438	55,502	56,018
Sweden	89,517	98,344	101,700	100,551
Italy	73,861	90,235	154,111	137,796
Denmark	68,009	81,588	98,403	87,304
Other Countries	144,792	124,245	114,805	114,163
Total	2,838,225	2,837,812	2,660,462	2,673,264

The above table was compiled by the Council of American Shipbuilders showing places held by the United States and other maritime countries in the gross tonnage of shipping under construction over the period September 1, 1927, to January 30, 1929.

(See Page 354.)

Seattle Yard Busy

The Alaska Steamship Company at Seattle is inaugurating a busy season at its marine outfitting plant at West Seattle, which will be working at capacity for about a year in outfitting two vessels for its Alaska service.

The company recently purchased the steamer Mexico from the Ward Line of New York and has brought the vessel to Seattle, where extensive alterations will be made to her passenger accommodations and general equipment. High pressure boilers will be installed to increase her speed and engine efficiency.

The steamship Alaska will have a turbo-electric drive installed, it is reported, to replace the reciprocating engines.

Dredge Delivered by Bethlehem

Captain Ben Walters of Stockton, California, has recently taken delivery from the Bethlehem Shipbuilding Corporation, San Francisco, of an electrically operated, all steel dredge costing $250,000. The dredge develops a horsepower of 1700 and will be used on a contract to remove 5,100,000 cubic yards of dirt from the Oakland estuary, the material being used in developing the new Alameda airport.

PORT CONSTRUCTION

Oakland. The Port Commission opened bids August 12 for the construction of the sub-structure for the Ninth Avenue Pier at Brooklyn Basin to be 1500 feet long, 224 feet wide, of reinforced concrete on concrete and wood jacketed piles, and an apron wharf 16 feet wide on creosoted piles and creosoted timber. The pier is to have two railroad tracks on pier side and three depressed tracks on rear.

The Port Commission has awarded contract for extending the Fourteenth Street Wharf on the western waterfront another 500 feet, to Healy & Tibbets, of San Francisco, work to cost $186,110.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of August 1, 1929.

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length over-all; 30' beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28; launched 6/17/29.

Hull No. 113, lightship, sister to above; keel Sept. 1/28; **launched 7/2/29.**

Hull 114, lightship, sister to above; keel Sept 1/28 est.

BALLARD MARINE RAILWAY COMPANY
Seattle, Washington.

Penquin, hull J-97, patrol boat for U. S. Bureau of Fisheries, Seattle; 130 L.B.P.; 27 beam; Union diesel eng.; deliver January/30.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT
Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Humuula, hull 5338, steel passenger and freight steamer for Inter-Island Steam Navigation Company, Honolulu, 218'3" L.O.A.; 38' breadth; 17' depth; Westinghouse turbines; 1100 gr. tons; keel April 1/29; launched June 15/29; deliver 8/5/29.

Not named, hull 5342, steel tow barge for Shell Co., Los Angeles; 131 L.O.A.; 40 beam; 9'6" draft; 1000 gr tons; keel 6/12/29; **launched 7/24, delivered 7/29/29.**

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A. Wanner.

Itasca, No. 21, diesel-electric cutter for U.S. Coast Guard: 250x42x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.; keel laid; launch 11/1/29 est.

Sebago, No. 22, same as above; keel **laid.**

Saranac, No. 23, same as above.

J. C. JOHNSON'S SHIPYARD
Port Blakley, Wash.

Four fish scows for Northwestern Fisheries Co., Seattle; 60x18x5'6"; **delivered June 22/29.**

One 60ft. service boat for Washington Pulp & Paper Co., Seattle; **delivered Aug. 14/29.**

Two scows for stock, 110x36x9.

LAKE WASHINGTON SHIPYARDS,
Houghton, Wn.

Purchasing Agent: A. R. Van Sant.

Foshay, hull 107, steel passenger and freight motorship for Northland Transportation Co., Seattle; 186x35 ft. beam; two 550-H.P. Washington-Estep diesel engs.; keel Mar. 4/29; **launched July 27/29.**

THE MOORE DRY DOCK CO.
Oakland, Calif.

Hull 179, steel carfloat for Atchison, Topeka & Santa Fe Ry. Co.; 260 L.B.P.; 38 beam; 7'6" draft; 1000 D.W.T.; keel 10/2/29 est.; launch 12/20/29 est.; deliver 1/11/30 est.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

Purchasing Agent: C. C. Labric.

Chief Seegay, hull 28, fish packer for Canadian Fish & Cold Storage Co., Prince Rupert, B.C.; 67 L.O.A.; 16'6" beam; 8'8" depth; 50 D.W.T.; 60 B.H.P. Fairbanks-Morse C.O. eng.; keel Mar. 15/29; launched June 6/29.

Ispaco I, hull 29, pilchard seine boat for Island Packing Co., Victoria, B.C.; 65 L.O.A.; 17'5" beam; 7'8" depth; 75-H.P. Atlas-Imperial diesel eng.; keel Mar. 15/29. launched June 7/29.

Ispaco II, hull 30, sister to above; keel Mar. 15/29; launched June 7/29.

Unnamed, hull 31, steel tug for Canadian National Railways; 90x20x9 (approx. dim.); 360 I.H.P. steam eng., 1 10ft. Scotch boiler.

Hull 32, steel car barge for Canadian National Railways, 184 x 40 x abt. 5 ft.; cap. 8 loaded cars.

Hulls 31 and 32 to be fabricated at yard; then shipped to Kelorona on Okanogan Lake for completion.

Hulls 33 to 36, inc., four wooden scows, 110 x 38 x 9'8"; keels 8/15/29 est.; deliver 10/15/29 est.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Six barges for Erector Dept.; 175 x 26 x 11 ft.; **5 delivered.**

Twenty-four cargo barges for Inland Waterways Corp.; 230x45x11 ft.; **4 delivered.**

Six sand and gravel barges for Rodgers Sand Co., 135 x 27 x 7'6".

AMERICAN SHIP BUILDING CO.,
Lorain, Ohio

Purchasing Agent: C. H. Hirsching.

William G. Clyde, hull 804, bulk cargo vessel for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12½ mi. speed; T.E. eng. 2200 I.H.P.; 3 Scotch boilers, 14x12 ft.; keel Mar. 25/29; **launched June 8/29;** deliver July 29/29 est.

Horace Johnson, hull 805, sister to above; keel Apr. 8/29; launch May 18/29 est.; deliver June 22/29 est.

BATH IRON WORKS
Bath, Maine

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer; keel Dec. 3/28; launch Apr. 10/29 est.; deliver May 1/29 est.

Hi-Es-Maro, hull 123, twin screw steel diesel yacht, Henry J. Gielow, Inc., New York, designer; 266'x35'x22' depth; 14'6" draft; two 1200 B.H.P Bessemer diesel engs.; keel Nov. 14/28; **launched 6/7/29; delivered Aug. 19/29.**

Corsair, hull 124, twin screw steel steam turbo-electric yacht; 343x42x27ft., 18 ft. draft; 6000 S.H.P.; General Electric turbo-generators; Babcock & Wilcox boilers; keel June 11/29; launch Jan. /30 est.

Ebb, hull 126, fishing trawler for Bay State Fishing Co., Boston, Mass., Bath Iron Works design; 132'4" L.O.A.; 121'6" L.W.L.; 24 beam; 13 depth; 500-600 B.H.P. Winton diesel engs.; keel 6/18/29; launch Nov. /29 est.

Notre Dame, hull 129, trawler for A. & P. Fish Co., Boston; 116 I.H.P.; 23 beam; 11 loaded draft; single screw; 500 I.H.P. Bessemer diesel eng.; keel 6/18/29; launch

Flow, hull 127, sister to above; keel 6/18/29; launch No. /29 est.

Malaina, hull 128, steel yacht; B. T. Dobson, designer; owner not named; 168 L.B.P.; 26 beam; 9 draft; twin Winton diesel engs.; 1600 I.H.P.; keel Dec. 5/29 est. Nov. /29 est.

Fordham, hull 130, trawler; sister to above; keel 6/18/29; launch Nov. /29 est.

Unnamed hull 131, steel aux. schr. yacht; Henry J. Gielow, designer; owner not named; 150 L.B.P.; 32 beam; single screw; 300 I.H.P. Bessemer diesel eng.; keel 10/1/29 est.

Not named, hull 132, twin screw diesel yacht for Henry J. Gielow, designer; 105 L.O.A.; 2 200-H.P. Bessemer diesels.

Not named, hull 133, twin screw diesel yacht; B. T. Dobson, designer; 125 L.O.A.;

2 400-H.P. Winton diesels.
Unnamed, hull 134, steel yacht, owner not named; 190 L.O.A.; 154 L.W.L.; 26 beam; two 800 B.H.P. Bessemer diesels; keel Nov. /29 est.
Unnamed, hull 135, same as above.
Unnamed, hull 136, same as above.
Unnamed, hull 137, same as above.
Unnamed, hull 138, same as above.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Northampton, light cruiser CL-26, for United States Navy; 10,000 tons displacement; launch Sept. 7/29 est.

Berwindvale, Hull 1422, single-screw coal collier for Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft. 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers; launched June 8/29.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Hull 1425, steel coasting vessel for Seaboard Shipping Co.; 450 gr. tons; launched May 29/29.

Hull 1426, steel barge for Gulf Refining Co.

Hulls 4252-54, three steel barges for Atlantic Transport Co. 700 Gr. T. ea.

Hulls 6139-40, two steel barges for Western Maryland Ry. Co., 499 Gr. T. ea.

BETHLEHEM SHIPBUILDING CORP., LTD.,
Baltimore, Md.

Hull 4240, steel 3-track carfloat for Western Maryland Railway; 325 x 38'6" x 10'8"; launched May 1/29.
Hull 4241, same as above.
Hull 4242, same as above.
Hull 4243, steel barge for Western Maryland Rly. Co.
Hulls 4244-4251, 8 scows for Arundel Corp.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; Winton engs.; General Electric generators and motors; keel Jan. 30/29; launch July 1/29 est.
No. 116, same as above; keel Feb. 6/29; launch Sept. 1/29 est.
No. 117, same as above; keel May 1/29; launch Dec. 1/29 est.
One all-welded tanker for stock.
One all-welded tanker.

COLLINGWOOD SHIPYARDS, Ltd.
Collingwood, Ontario.

Purchasing Agent, E. Podmore.
No name, hull 83, tug for Toronto Harbor Comm.; 100 x 25 x 12'6"; 11 loaded speed; T.E. engs. 1000 I.H.P.; Scotch boilers, 195 lbs. press.; keel July 25/29.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Dolphin, hull 2938, 66ft. day cruiser for H. Murray; 2 170 H.P. Speedway engs.; deliver Aug. 1/29 est.

DEFOE BOAT & MOTOR WORKS.
Bay City, Mich.

Purchasing Agent: W. E. Whitehouse.
Olive K., hull 133, steel yacht for C. F. Kettering, Detroit; 169 L.B.P.; 26 beam; 12 loaded draft; 15 knots speed; 600 D.W.T.; 1000 I.H.P. diesel engs.; keel Jan. 15/29; launch July 1/29 est.; deliver Aug. 15/29 est.
Not named, hull 136, steel yacht for A. V. Davis, New York; 138'6" L.B.P.; 18 beam; 5 loaded draft; 20 M.P.H.; 150 D.W.T.; 1400 I.H.P. diesel engs.; keel July 15/29 est.; launch Oct. 1/29 est.; deliver Apr. 15/30 est.
Maruell, hull 137, steel yacht for M. H. Alworth, Duluth; 135 L.B.P.; 22 beam; 6'9" draft; 14 M.P.H.; 175 D.W.T.; 600 I.H.P. diesel engs.; keel Apr. 15/29; launch Sept. 1/29 est.; deliver Nov. 1/29 est.

DRAVO CONTRACTING COMPANY,
Pittsburg, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'6" x 26'6" x 5' 6".
Hull 817, one welded steel barge for stock; 100 x 26 x 6'6".
Hulls 821 to 825 inc.; 5 deck scows for New York Central R.R.; 100'x33'8"x9'7" 2 delivered.
Hull 832, steel oil barge for Atlantic, Gulf & Pac. Co., 100x30x 9 ft.
Hull 833, steel floating dry dock for Warner Co., Philadelphia.
Hulls 838-843 inc., 6 standard sand and gravel barges for stock.
Hulls 844-855 incl., 12 standard sand and gravel barges for stock; 100x26x6'6".
Hull 856, steel oil barge for Atlantic, Gulf & Pacific Co.
Hulls 899-906 incl., 8 sand and gravel barges for Keystone Sand & Gravel Co.; 135x27x8'.
Hull 908, 909, two steel hull whirler derrick boats for U. S. Engineers Office, Memphis.
Hulls 910-913 inc., four steel grain barges for Western Stevedoring Co., 130x30x16'6".
Hull 916, steel hull floating grain elevator for Western Stevedoring Co.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.
Hull 109, dredge hull for Gahagan Const. Co., 160 x 40 x 13'6"; keel Mar. 13/29; launched June 1/29; delivered July 14/29.
Hull 111, steel welded barge for O'Brien Bros.; 120 x 36 ft.; 1200 D.W.T.
Hull 112, barge for Venezuela Gulf Oil Co.; 80 x 24 x 6 ft.

GREAT LAKES ENGINEERING WORKS,
River Rouge, Michigan

Myron C. Taylor, hull 269, bulk freighter for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12 mi. speed; 12,000 gr. tons; TE engs. 2250 I.H.P. 2 W.T. boilers; keel Mar. 14/29; launched July 15/29; delivery Aug. 25/29 est.
Hull 271, steel dump scow for Dumbar & Sullivan Dredg. Co.; 168 x 40 ft.; keel 5/29/29; deliver Aug. 10/29 est.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.
Hull 1677, track barge for Yourtel-Roberts Sand Co., Chester, Ill.; 195x30x6'6"; keel July 15/29.
Hulls 1673-1676, four combination cargo and oil barges for American Barge Line Co., Louisville, Ky.; 150x35x11'; one keel 5/10/29; keel 6/5/29.
Houghland, hull 1672, steel hull for towboat for Walter G. Hougland, Bowling Green, Ky.; 86x22'x42"; keel 4/10/29; launched 6/5/29; delivered Aug. 25/29.
Hulls 1667-1671, five steel motorboats for U.S. Engineers, Vicksburg, Miss.; 30 x 7'6"x2'6"; keels May 23, 29, 31/29; June 3, 4/29; delivered July 20/29.
Hull 1661, steel hull, steam towboat, for stock; 148x30x5 ft.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.
City of Saginaw, hull 246, car ferry for Pere Marquette Rail; Co.; 368 L.B.P. 57 beam; 17 loaded draft; 18 m. speed; 2 turbines; 3600 I.H.P. each; 4 Babcock & Wilcox W.T. boilers; keel Mar. 4/29; launch Aug. 6/29 est.
City of Flint, hull 247, car ferry, sister to above; keel May 1/29.
Reality, hull 248, steel yacht, owner not named; 78 long; 15 beam; 8'9" depth;

6' draft; 150 H.P. Fairbanks - Morse eng.; keel June 12/29; launch Aug. 3/29 est.

Hull 249, barge for E. Gillen, Milwaukee; **delivered.**

Hull 250, same as above; **delivered.**

Hull 251, derrick barge for T. L. Durocher, Detour, Mich.

Hull 252, same as above.

MIDLAND BARGE COMPANY
Midland, Pa.

Five steel cargo barges for Inland Waterways Corp.; 230x45x11 ft.; 4 keels laid; **launched.**

One steel hull for New York State Canal Comm.; 106x30x7 ft.

Five steel barges for N.Y. State Canal Comm.; 75 x 25 x 5'6".

One barge for M. H. Treadwell Co., New York; 115x34x9'11".

One barge for M. H. Treadwell Co., New York; 106 x 30 x 7 ft.

One barge for above; 40x13x4.

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Stadacona, hull 24, bulk freighter for Canada Steamship Lines, Ltd., Montreal; 582 L.B.P.; 60 beam; 20 loaded draft; 11 knots speed; 12,000 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 Scotch boilers; 15'3" dia x 11'6" lg.; keel Apr. 17/29; launch Aug. /29 est.; deliver Sept. /29 est.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, R. L. Baldwin.

W. W. Fischer, hull 169, diesel towboat for Central Sand Co.; 120x26x5½ ft.; 720 I.H.P.; Fairbanks-Morse diesel; keel Feb. 15/29; launched 6/22/29; **delivered July 15/29.**

Hulls 188-189, two deck barges for stock; 100x24x5 ft.; keels Mar. 21-28/29; **launched and delivered May 20/29.**

Hulls 190-191, two deck barges for stock; 75x20x5 ft.; keels Apr. 3-7/29; **launched and delivered May 15/29.**

Hull 192, deck barge for stock; 120 x 30x6 ft.; keel Apr. 2/29; launch May 25/29; **delivered June 2/29.**

Hulls 194-195, 2 deck barges for stock; 100 x 24 x 5 ft. keels 5/24 and 30/29; **delivered June 27/29.**

Hull 196 drydock, 42 x 36 x 5 ft.; **delivered Aug. 1/29.**

Hull 200, towboat, owner not named; 56x14x5'6"; keels July 15/29 est.

Hulls 201-4 inc., four deck barges for stock; 130x32x8 ft.; keels laid 6/24, 7/1, 7/6, 7/12; **launched 7/24, 7/25.**

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; launch Sept./29 est.; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Pennsylvania, hull 329, 18 - knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Oct. 15/28; launched July 10/29.

Ward, hull 332, diesel conversion for U.S. Shipping Board; **delivered July 29/29.**

Not named, hull 337, passenger liner for A.G.W.I. Nav. Co., New York; 508 x 70'9" x 39'; 15,380 tons displ.; 16,000 S.H.P.; 20 knots speed; turbo-elec. drive; **keel July 23/29.**

Not named, hull 338, sister to above; **keel July 8/29.**

NEW YORK SHIPBUILDING CO.
Camden, N. J.

Purchasing Agent: J. W. Meeker.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; launched Jan. 23/29; deliver July 9/29 est.

Chester, light cruiser CL- 27 for United States Navy. 10,000 tons displacement; keel Mar. 7/28; launched 7/3/29; deliver June 13/30 est.

Santa Clara, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'9" beam; 37'5" depth; General Electric turbo-electric machinery; keel Feb. 4/29; launch Sept./29 est.; deliver Apr./30 est.

Hull 390, carfloat for Erie R.R. Co.; 366x38x10'5"; keel 5/29/29; launch Aug. 8/29 est.; deliver Aug./29 est.

Hull 391, same as above; keel May/29; launch July /29 est.; deliver Aug. /29 est.

Hull 392, same as above; keel June 26/29.

Hull 393, same as above; keel June 26/29.

Hull 298, cement barge for International Cement Corp.; 156'x37'4"x13'; **keel July 22/29;** launch 9/16/29 est.; deliver 9/30/-launch Aug. 20/29 est.; deliver Sept. 15/29 29 est.

THE PUSEY & JONES CORP.,
Wilmington, Del.

Purchasing Agent: James Bradford.

Nakhoda, hull 1040, yacht for Fred J. Fisher, Detroit; 236 L.O.A.; 34 beam; 19 depth; 12'6" draft; 2 1100 H.P diesel engs.; keel Feb. 12/29; launch 8/19/29 est.; deliver 11/15/29 est.

Rene. hull 1041, yacht for Alfred P. Sloan, Jr., New York- same as above; keel Feb. 12/29; launch 9/15/29 est.; deliver 12/1/29 est.

Cambriona, hull 1042, yacht for owner not named; same as above; keel Mar. 12/29; est.

Lotusland, hull 1043, twin screw diesel yacht, ordered by Cox & Stevens, Inc., New York; 168'9" long, 28' beam; two 500-B.H.P. diesel eng.; keel June 13/29; deliver Dec./29 est.

THE SPEAR ENGINEERS, INC.,
Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor, keel Aug. 18/28.

City of Norfolk, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P., keel Feb. 1/29; launch July 30/29 est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Not named, hull 265, steel hull, steam driven, patrol vessel for Supervisors of New York Harbor, 39 Whitehall Street, New York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam; 10'1½" mean draft; T. E. engs.; Babcock & Wilcox W.T. boilers; keel Apr. 6/29; launch 10/12/29 est.; deliver 12/12/29 est.

Not named, hull 266, steel hull freight and passenger tug for U. S. Dept. of Public Health, Boston; 91 L.O.A.; 20 molded beam; 9 draft; 350 H.P. Standard diesel eng.

SUN SHIPBUILDING COMPANY,
Chester, Penn.

Purchasing Agent: H. W. Scott.

Not named, hull 116, passenger and freight motorship for American South African Line, Inc., New York; 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs.; keel Mar. 14/29; launch Sept. 14/29 est.; deliver Nov. 15/29 est.

Cayuga Sun, hull 118, oil tank barge for Sun Oil Co.; 188'6" L.B.P., 31' breadth, 11'6" depth; 6000 bbls. capacity on 9ft. draft; diesel-electric propulsion; 2 Bessemer diesels, Westinghouse motors; keel Mar. 11/29; launched 7/10/29; delivered July 19/29.

Seneca Sun, hull 119, sister to above; keel Mar. 18/29; launched 7/17/29; delivered 7/22/29.

Not named, hull 120, single-screw, diesel tanker for Sun Oil Co., 13,400 D.W.T.; keel 6/5/29; deliver 11/30/29 est.

No name, hull 122, sister to above.

Tidemotor, hull 121, steel oil barge for Tidewater Oil Co., New York; 188'6" x 31' x 11'6"; 6000 bbls. capacity on 9' draft; keel 5/20/29, launch 8/7/29 est.; deliver 8/27/29 est.

TOLEDO SHIPBUILDING CO.,
Toledo, Ohio.

Purchasing Agent. Otto Hall.

Not named, hull 182, fire boat for City of Detroit; 125 L.B.P.; 29 beam; 10 loaded draft; 14 mi. speed; comp. engs.; 950 I.H.P.; 2 B. & W. boilers; deliver Aug./29 est.

UNITED DRY DOCKS Inc.
Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Pittsburg, hull 784, dredge hull for Atlantic, Gulf & Pacific Co.; 162 L.B.P.; 44 beam; 15 loaded draft; keel Feb. 26/29; launched 6/14/29.

Unnamed, hull 790, tug for Standard Transp. Co., New York; 91'6"x22'x10'9"; 12 loaded speed; comp. eng. 500 I.H.P., 1 Scotch boiler; 12'6"x11'; keel June 29/29.

Unnamed, hull 791, tug, sister to above; keel June 29/29.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Beverly, hull 80, steel tug, U.S. Engineers, Philadelphia; 65'6"x17'x7'7½"; keel May 4/29; launch Aug./29 est.; deliver Sept./29 est.

Unique, hull 81, yacht for Harold M. Ward, Charleston; 50 x 12 x 4 ft.; keel June 4/29.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD., Union Plant

Drydock, clean, paint, misc. repairs: Malolo, J. C. Fitzsimmons, Calistoga, Manukai, Richmond, Cadaretta, R. J. Hanna, San Mateo, Matsonia, McKittrick, Sonoma, Esparta, K. R. Kingsbury, El Salvador, Claremont, Brookings, Daisy Gadsby, Martha Buehner, Brookings, tugs Morgan Shell, F. A. Douty, Gov. Irwin, gas yacht Carnegie, ferry San Pedro, dredge Sacramento, barges Martinez, State No. 3, U. S. Engineers Barge 3. Tailshaft: Dorothy Alexander, F. H. Hillman. Propeller repairs: Lena Luckenbach, ferry Mendocino. Repair stern frame: Manukai. Furnish and install ventilator cowls: York City, Welch City. Miscellaneous repairs: La Perla, Mongolia, Bolivar, Maunganui, Silverpine, Chetopa, Point Gorda, Hauraki, San Jose, Winemoor, Swanley, ferry San Mateo, s.s. California, Waiotapu, Limon, Point Reyes, Point Bonita, Meton, Borgstad, Carlos, Lio, Silverlarch, Mary Luckenbach, Point San Pablo, Virginia, H. W. Baxter, Horace X. Baxter, Hanley, Daisy Putnam, Wisconsin Bridge, Phyllis, Whitney Olson.

COLLINGWOOD SHIPYARDS, Ltd.,
Collingwood, Ontario.

New tail shaft and wheel; stern bearing relined; bottom damage repairs: steamer Manitoulin.

LOS ANGELES SHIPBUILDING & DRYDOCK CO.,
San Pedro, Calif.

Drydock; heavy weather damage repairs; renew several thousand rivets: California. Blow-down and voyage repairs: strs. Shabonee, Tamaha. Drydock, voyage repairs: La Brea (also install new heater coils), Chilbar, Chiloil, Larry Doheny. Drydock, renew several frames: yacht Sultana. Drydock and engine repairs: Associated Oil barge. Drydock, temporary repairs, examine for grounding damage: Anne Hanify. Drydock, renew margin angles; Glen Doyle. Drydock, paint entire yacht: Gallardo. Drydock, clean, paint: tug Peacock. Voyage repairs: Golden Hind.

U. S. NAVY YARD,
Bremerton, Wn.

Misc. repairs and docking: Idaho, California, West Virginia, Neches, J. D. Edwards, Reno, Henshaw, Smith Thompson, Barker, McCawley. Misc. repairs: Dellwood.

TODD DRY DOCKS, Inc.,
Seattle, Wn.

Drydock, clean, paint, misc. repairs: Capac. Fire damage repairs: Mauna Ala. Drydock, clean, paint: Nizina. Drydock, rudder repairs, etc.: tug Iroquois. Misc. repairs: ferry City of Victoria, strs. Hanley, Harry Luckenbach, K. I. Luckenbach, J. I. Luckenbach, Oriole, President Madison, Seattle, Silverpine.

At San Pedro —

Luckenbach depends on

Luckenbach Docks, Terminal Island, where Permanent 12" Supercore Hawsers hold steamers safe from tides.
(P[illegible] Courtesy Luckenbach Line)

Splicing 12" Supercore. Luckenbach's veteran splicer says "It's Easy."

TUBBS CORDAGE COMPANY
SUPERCORE
SAN FRANCISCO

RIGOROUS tide conditions at SAN PEDRO caused LUCKENBACH to investigate a super rope. Splendid service of SUPERCORE, the new hawser and mooring line, on various LUCKENBACH steamers caused its specification here.

SUPERCORE is giving service daily to thirty-five steamship lines. All users agree on its enduring qualities. Supercore will save users 20 to 30 percent.

TUBBS CORDAGE COMPANY

SAN FRANCISCO, CALIFORNIA

200 Bush Street KEarny 1596

S[illegible] Worlock Patents Ju[illegible] 92[illegible] October [illegible]

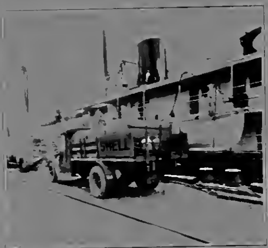
Who did What ---and How

THE latest vessel built by the Bethlehem Shipbuilding Corporation at San Francisco is the steamer Humuula, which was recently completed for the Inter-Island Steam Navigation Company.

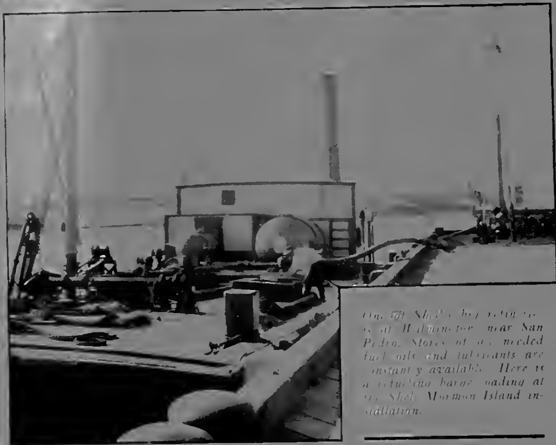
The chief engineer of this vessel is Lewis Swain. He was formerly chief engineer on the steamer Hawaii, also in the Hawaiian service of the same company.

When it came to select a quality oil, the officials of the Inter-Island Steam Navigation Company specified Shell Turbine Oil, which was pumped into the turbine system and reserve tank of the Humuula.

The picture below shows the Shell tank truck pumping Shell Turbine Oil into the steamer Humuula's tanks.



There are hundreds of vessels using Shell marine lubricants all over the world, including diesel, motor, turbine and triple-expansion propelled vessels. Shell oils are supplied for main engines and auxiliary machinery lubrication not only at Pacific-American ports but in foreign ports as well. The illustration shows the "Yojin Maru" receiving a delivery of Shell oil at a Northwestern port. This Japanese vessel trades between Japan and the Pacific Coast.

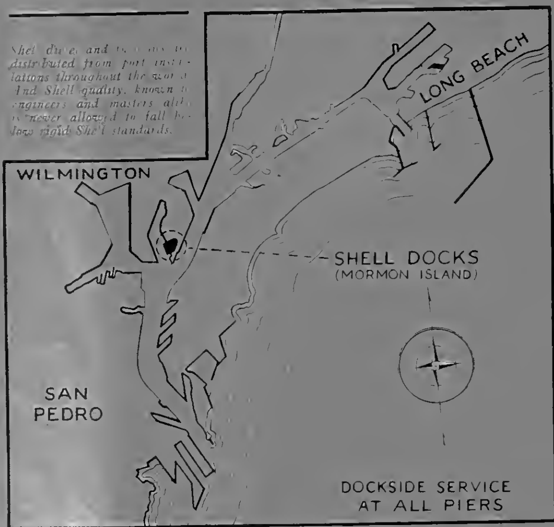


One of Shell's key installations is at Wilmington near San Pedro. Stores of all needed fuel oils and lubricants are instantly available. Here is a refueling barge loading at the Shell Mormon Island installation.

Shell Facilities at Los Angeles

(Port of Los Angeles)

Shell diesel and fuel oils are distributed from port installations throughout the world and Shell quality, known to engineers and masters alike, is never allowed to fall below rigid Shell standards.



Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

Captain Henry Griffin Curtis, of Searsport, Maine, one of the deep-sea captains who made that little town famous throughout the world, passed away July 19 at his home, aged 78 years. A man of sterling integrity and strict honesty, he had a strong personality and was a great reader and deep thinker. Kind and considerate, his loss will be keenly felt in the community of which he was a most loyal member for many years. He loved his home and was particularly happy when reminiscing with friends on his roomy porch overlooking the sea. It had been his daily habit to raise the Stars and Stripes on a mast-like flagpole at his home, and when he died the flag was lowered to half mast. The making of this pole had been the last work of one of the old-time Searsport spar makers.

Captain Curtis began sea life at 19 years of age, going with his uncle Lebbeus Curtis, Sr., in the ship Hope. Some nine years later he succeeded to the command, and in subsequent years was master of the ships John C. Potter, Belle of Bath, and State of Maine. Retiring from sea life in 1898, he was for two years in the stevedoring business at Brunswick, Georgia, with a brother and subsequently for some eight years was superintendant of the American Agricultural Chemical Company's plant at Searsport.

Captain Curtis was twice married, his first wife passing away in 1894. As a bride she had accompanied him on his second and last voyage as master of the Hope, a daughter being born at sea and given the name of the ship. This lady is now Mrs. Calderwood of Roxbury, Mass. On board the John C. Potter a son was born, he now being Captain George McClure Curtis, commander of the steamer Golden Cross running between San Francisco and Australia. There were no children by his second marriage in 1900.

Captain Curtis' second voyage in the Hope was momentous. Leaving New York in August, 1891, he went to Hong Kong; took a cargo thence to Callao, and from there went to Port Blakeley and loaded lumber for Valparaiso. On this latter voyage the Hope encountered a gale in latitude 18 north, in which the rudder head was twisted so that the ship could not be steered, she coming to by the wind and being thrown on beam ends. The gale increasing to hurricane force, she was totally dismasted and was left with eight feet of water in the hold. The next day she was fallen in with by the British bark Bankfields. Captain Asplet, who on arrival at San Francisco reported that he had boarded the Hope and stood by until the next morning. Captain Curtis said that he could repair damages and keep his vessel free with the pumps sufficiently to complete his voyage, so after the Bankfields had supplied him with a few requisites, the vessels parted company. The gale had left the Hope without even any spare spars, but Captain Curtis improvised a jury rig from timbers in his cargo. He had his ship pumped out and then headed for Honolulu. Without any sailing directions he made a good landfall, and, 32 days after the disaster, arrived off the port of Honolulu. The officers of the U.S.S. Alaska, which was then at Honolulu, issued an open letter highly commending Captain Curtis for the "great ability, intelligence, and seamanship displayed, which with his pluck and resolution enabled him to surmount the difficulties that beset him." It was also stated that "indeed it seems a miracle that the ship was saved."

Captain Henry Griffin Curtis.

The Hope was condemned at Honolulu and sold there, after which Captain Curtis, his wife and seven months old daughter, went home via San Francisco. The Captain later proceeded to Hamburg to take command of the John C. Potter. The first Mrs. Curtis had been Miss Emma F. McClure, daughter of Captain George and Jane Nichols McClure. Mrs. Curtis 2nd had been Miss Grace Gordon, of Bridgewater, Massachusetts, and she is still living in Searsport.

Captain Leb. Curtis, of Pillsbury & Curtis, San Francisco, is a cousin.

The engine room of the Panama Mail liner El Salvador is now in charge of Chief Engineer **William Sykes**, formerly of the steamer Venezuela. He relieved **George Whitehead**, who is remaining shore-side on vacation. Chief Sykes' berth on the Venezuela was filled by **William W. Bowers**, formerly first assistant engineer on the liner Colombia.

The appointment of Captain **Robert E. Judson** as San Francisco Bar Pilot met with the enthusiastic approval of the maritime fraternity. Captain Judson, born and reared in San Francisco, is one of the best known and most popular shipmasters sailing out of the Golden Gate. His appointment to fill the vacancy made by the passing of **Captain John W. Wallace** occasioned no great deal of surprise, as his name for the pilot's berth has been mentioned for more than two years. Just a few months ago, Captain Judson resigned his command of the liner Colombia to accept the appointment as pilot at Los Angeles Harbor. Captain Judson has been with the Pacific Mail and the Panama Mail for more than twenty

years. He has sailed coastwise as commander of passenger liners and has won an enviable position as a shipmaster.

John Miller, assistant dock superintendent for Sudden and Christenson at San Francisco, claimed as his bride last month Miss **Evelyn Wilson** of Santa Maria. The couple are just back from their honeymoon and have established themselves in a beautiful new home in San Francisco.

Cyrus Anderson, San Francisco agent for the Atlantic, Gulf and West Indies Company, has been advised by **Franklin D. Mooney**, president, of the start of construction work on two 20-knot electrically driven sister ships for the New York-Havana service of the Ward Line, the second unit of the company's $10,000,000 shipbuilding program.

The keel of the second vessel has been laid at the Newport News Shipbuilding and Drydock Company, the first having been started two months ago. Both vessels will be ready for service for the 1930 winter tourist season, President Mooney's report stated.

The Panama Pacific Line announces that **Lewis Daughtrey**, formerly chief steward on the **Virginia**, is now standing by at Newport News, and will come out on the new liner **Pennsylvania** in the same capacity. **Charles Bennett**, for many years a chief steward on vessels of the International Mercantile Marine Company, has taken Daughtrey's post on the Virginia.

The **Panama-Mail Line**, the **Panama-Pacific Line**, the **American-Hawaiian Steamship Co.**, and all lines operating in the intercoastal trade are taking extra precautions to prevent the entrance of the Mediterranean fruit fly pest to any of the ports where their vessels dock. Cold storage tanks are being fumigated to exterminate any stray flies or other insects. Chief Steward **Charles Bennett** and assistants are inspecting all "bon voyage" packages addressed to passengers of the Virginia in order to keep out the pests. In addition only branded California fruits are to be used on vessels of the Panama Pacific fleet until further notice, it was announced by Captain **Kirkwood Donavin**, operating manager for the company, who said, "With the fruit fly destroying crops in Florida to such an extent that people are panic-stricken and banks in citrus districts are closing their doors, we feel that we must make certain that no fruit fly comes to California on any of our vessels. As one fly lays from 600 to 1000 eggs, most of which mature, it can readily be seen why we are taking no chances."

Walter B. Allen, president of the Los Angeles Harbor Commission for the last four years, has been re-elected to serve his fifth term in that office.

J. H. Crawford, vice-president of the commission for the past year, was also re-elected. The re-elections were made on motion of Commissioner **Emerson Spear**, seconded by Commissioner **F. M. Andreani**. During the successive terms of Allen numerous improvements have been sponsored by him and revenues have shown a decided increase.

Captain S. Kampen and Chief Engineer H. Giesel of the motorship Havel.

Sponsored by the Junior Chamber of Commerce, **Harbor Day** was celebrated by San Francisco on August 22, with 65 outstanding citizens and leaders of the shipping world heading the several committees handling the various events. This day is to be an annual event established to create greater interest in the position of San Francisco Bay as the second most important port of entry in the United States, and as the greatest landlocked harbor in the world, according to **Arthur Brown**, president of the junior chamber.

Wilson Meyer, chairman of the marine committee of the chamber, arranged various water events, perhaps the most colorful being the race between crews of ships flying the flags of all nations. Parades, band concerts, visits to the Japanese training squadron then in port, aviation exhibitions by planes of the army, navy, and marine corps, yacht races, swimming events, dinner dances on liners tied up at their docks formed part of the huge program arranged by the junior chamber. Perhaps the most beautiful and colorful event was the maritime parade staged at sunset and seen by thousands from vantage points in the hills of San Francisco and Marin Counties.

B. Hauschild, Pacific Coast passenger manager for the **North German Lloyd**, received official advices from the New York headquarters of the line stating that the official time made by the company's superliner Bremen was 4 days, 17 hours, and 42 minutes.

As the distance from Cherbourg to New York is 3164 nautical miles, the time made by the Bremen means she averaged 27.83 knots for the entire distance, setting a new world record and beating the best time ever made by the Cunard liner Mauretania by 8 hours and 52 minutes. No special attempt was made to set a new speed record by the officers of the vessel, the vessel's engines having been allowed to run without any forcing whatsoever.

Great enthusiasm was displayed by the public when the giant liner steamed up New York harbor and she was met by **Mayor Walker** and a host of notables prominent in the civic life, industry, and upbuilding of the greatest port.

John Young, for many years a member of the freight brokerage firm of **Simpson, Spence & Young**, died in London on July 31, according to a recent report received in San Francisco Shipping circles. Young was widely known in the world's steamship field.

William W. Swadley, San Francisco marine photographer, died August 6, following a short illness. Swadley made marine photography a specialty and his work among the ships and shipping fraternity of San Francisco gave him a wide circle of acquaintances and friends.

During the Panama Pacific International Exposition, Swadley's photography made him world famous, and at various times he served on the art staffs of newspapers in his home city.

Holland-American Line has ordered another new motorship for the Pacific Coast-Europe fleet of the company, according to advices received by **C. W. Wulffraat**, general freight agent at San Francisco, from **E. F. R. de Lanoy**, Pacific Coast manager of the Line. De Lanoy is at present in Rotterdam, and will return shortly. The vessel will be 500 feet in length and will have 140,000 cubic feet refrigerator space. Diesel engines are to be installed and the vessel will have a speed of fourteen knots.

Recent advices from the east coast report the resignation of **Robert A. Krug** from the staff of the **Kerr Steamship Company** with which he had been connected for about fourteen years.

Eugene Floyd, general freight agent of the **Dollar Steamship Lines** with headquarters at San Francisco, has been elected chairman of the Pacific Westbound Conference for the ensuing six months. He succeeds **George E. Chapin**, assistant general freight agent for the **Nippon Yusen Kaisha**. **E. J. A. Watts**, secretary of the conference, made the announcement.

To take a much-needed rest, **Willis D. Benson**, Pacific Coast manager of the **Transmarine Lines** with headquarters at San Francisco, recently announced his retirement effective October 15. He will be succeeded by **Captain C. L. Meek**, who has acted as district manager for the company at Seattle.

Benson's rise was rapid in the world of transportation. He started as a clerk for the Chicago and Northwestrn Railroad and later became chief rate clerk for the Northern Pacific. His steamship affiliations started with the Frank Waterhouse Co. at Seattle, and during the World War he became vice-president of the company. In 1923 he took over his present duties with the Transmarine Lines.

Captain Meek has been with the Transmarine Lines for seven years, having served in the New York and Beaumont offices of the firm, coming to Seattle in 1927.

Captain Meek's former position in Seattle is to be taken over by Captain **H. M. Sorenson**, who has been the company's port superintendent at Aberdeen.

The trip of the **Panama-Pacific** liner **Virginia**, westbound, ending July 29, was a record-breaker. The vessel arrived with the largest list of passengers ever carried from the east coast in Panama-Pacific liners, and the ship also broke the speed record for the company's fleet between San Pedro and San Francisco. The running time of the Virginia from San Pedro to San

Captain Andreas C. Paulsen, commander of the Panama Mail Liner Guatemala.

Francisco was 20 hours and 20 minutes from dock to dock, the liner averaging 18½ knots while bucking a strong wind all the way up the coast, Chief Engineer **Ernest Prince's** log showed. The vessel brought 262 passengers to San Francisco after having discharged 321 at Los Angeles and 64 at San Diego. Including the officers and crew, the Virginia arrived at San Diego with 1127 souls aboard. The total number of passengers handled on this trip was 647, a capacity list.

Among the arrivals were Captain **Thomas M. Lyon**, port captain for the company at New York, who is studying terminal facilities on the west coast, as well as other conditions being met by vessels of the fleet. With the **Pennsylvania**, third of the company's new electric liners, due to arrive in San Francisco in November, the Panama-Pacific line officials are considering port improvements from every angle, and Captain Lyon is making a close study of the contemplated changes all along the route of the ships.

William Allen is now in charge of all the western territory of the United States regarding passenger and freight business for the United States Lines and American Merchant Lines, and is located in Chicago.

Allen is no stranger to American shipping. He was formerly foreign trade manager for the Board of Commissioners at New Orleans, and was one of the leading organizers of the National Merchant Marine Association. He had been in Washington as chairman of the executive committee of the National Merchant Marine Association until he was selected to head the Western interests for the United States Lines.

Upon completion of the new half-billion dollar terminal at **Richmond**, that city will take its place with other San Francisco Bay cities as a port of call of vessels of the Pacific Conference.

The terminal is situated on the east bank of the inner harbor and is scheduled to begin operation September 1. Extra switching charges which may result in landing and transshipping cargo will be absorbed by the **Parr-Richmond Terminal Corporation**, operating this city's harbor facilities.

All extra charges will be absorbed on cargo destined for San Francisco and East Bay points, according to announcement. Under this plan, **Fred Parr**, head of the firm, explained that it would be possible for a carload of freight destined for a San Francisco point to be discharged at the Richmond terminal and to be handled over the Southern Pacific via Dumbarton Bridge or over car ferries, and reach its destination with a minimum of delay and at no more cost.

With the steamer **President Fillmore** and the **President Johnson** in the round-the-world service, two other vessels have been released from the globe girdling service to enter the recently announced direct Los Angeles and San Francisco to Manila service of the **Dollar Steamship Company**. The President Johnson started in the round-world service early in the year and the President Fillmore was but recently entered.

Appointment of **Thomas G. Maddux**, widely known figure in rail

and shipping circles as district freight agent at Los Angeles for Williams, Dimond & Co., was made known recently.

Arthur E. Moncaster, one of the best known engineers on the Pacific Coast, died recently and was buried from his residence in the East Bay. He passed away following a brief illness. Moncaster was for many years with the old Pacific Mail Company and served as engineer on the largest liners of that company. He was port superintendent of the Pacific Mail when the line went out of operation. He then retired.

Mariners and shipping officials of both coasts mourn the passing of Captain **John W. Wallace,** 55, port captain and secretary of the San Francisco Bar Pilots Association, following a protracted illness.

Captain Wallace was a veteran bar pilot, in which capacity he has served for more than 25 years. The son of the late Captain George Wallace, famous shipmaster and pilot, he sailed from the Port of San Francisco as an apprentice with his father on the J. B. Walker. When the elder Wallace transferred as a bar pilot the son assumed command of the J. B. Walker.

He is survived by his widow, Mrs. Frances Wallace, his mother, Mrs. Marietta B. Wallace, and one daughter, Mrs. Stanley Wood of Redwood City.

Captain **Gerald Tyrrell January,** member of the State Board of Pilot Commissioners, is a staunch advocate of a nautical school ship for the training of youth for sea vocations. In a lengthy statement Capt. January recently said:

"California will soon have a nautical ship in operation. This school will fill an urgent need on the Pacific Coast and is the outcome of the efforts of several groups of public spirited and far-sighted men. Atlantic seaboard states have maintained ships of this kind for several years. These schools have given the American boy an opportunity of obtaining a basic education in the calling of the sea. Graduates from these schools have been successful in American shipping for many years. California's nautical school will in all probability pattern itself after the Eastern schools at the start. This will be necessary during its formative period, but once under way, the board of governors and the school's captain will seek to evolve a broader educational point. It would seem that the ideal type of vessel for the purpose of training and instilling a certain psychological reaction, possible by no other means, would be a full-rigged ship, rearranged and equipped with all modern machinery, such as diesel or turbo-electric propulsion units, and all the other virtues of the modernly equipped vessel."

Edgar E. Piper, formerly with the **Columbia Pacific Shipping Company** and more recently with the firm of **Griffith, McBride & Piper,** has joined the staff of **Ernest E. Johnson & Company** in Portland.

After a tour of the world, **Harry S. Scott,** president of the **General Steamship Corporation,** San Francisco, is home. He reported that maritime conditions throughout the world were in a healthy condition and all shipping countries look for increased prosperity in maritime conditions.

The annual steamship night of the **Pacific Traffic Association** of San Francisco, held August 13, was the most successful since the inception of the organization. **Roger D. Lapham,** president of the American-Hawaiian Steamship Company, was the principal speaker of the evening. Other leaders of the maritime world who spoke were: **Charles L. Wheeler,** vice-president and general manager of the McCormick Steamship Company, and Major Charles L. Tilden, president, Board of State Harbor Commissioners, San Francisco.

The Kokusai Steamship Company's cargo steamer Clyde Maru discharging Japanese beech logs at Grays Harbor, Washington. In the group are included, from left to right: Grays Harbor Port Commissioner Frank H. Lamp, president of the Washington State Chamber of Commerce; H. Kobayashi, representing the shipper of the hardwood; Charles McCleary of the McCleary Timber Company; Frank H. Hill of the Twin Harbor Stevedoring Company; Captain H. Uoyama, master of the Clyde Maru; W. B. Cross, Boston manufacturer; I. Abe, Seattle manager for Kokusai; S. Ishii, chief officer, Clyde Maru; and Marsh S. Davis, Twin Harbor Stevedoring Company.

Fair Exchange

THE steamship Clyde Maru, flagship of the Kokusai line plying between the Orient and Pacific Northwest ports, brought to Grays Harbor early in July a cargo of 400,000 board feet of Oriental beech wood logs.

This shipment, the first of its kind to be brought to Grays Harbor, is the forerunner of business that is expected to develop into large proportions.

The logs were unloaded from the Clyde Maru at the Grays Harbor port terminal and placed aboard train for shipment to the McCleary Lumber Company mill at McCleary in eastern Grays Harbor county.

Since Japan takes millions of feet of lumber annually from the Grays Harbor mills this seems to be the beginning of a very fair trade exchange.

Snaps at the second monthly dinner of the Propeller Club of San Francisco, show left to right: (1) Robt. Christie, Christie Machine Works; Chief Eng. M. C. Doyle, S.S. Van Buren; Jos. P. Dolan, U.S. Steamboat Inspection Service; and J. Bacciocco, Calif. Meat Co. (2) Milton Cooper, General Pet. Co.; Frank DePew, Moore D.D. Co.; J. A. Thomson, U.S.A.T.; Orville Davis, A. Paladini, Inc.; H. A. Brann, Haviside Co.; and Capt. Stanley Allen, Standard Oil Co. (3) Al Short, Sup. Eng. Alaska Packers Assn., in piano monologue. (4) Jos. P. Dolan, pres. Propeller Club of San Francisco. (5) Capt. Edw. Mason, Capt. C. F. Parker, Capt. A. S. Walton. (6) L. K. Siverson, sales mgr. Bethlehem Shipbuilding Corp; Capt. Al T. Hunter, General S.S. Corp.; and Geo. Schirmer. (7) Ray Gunzel, port. eng. Charles Nelson Co., and H. J. Anderson, secr. Pacific Coast Drydock Association.

Trade, Traffic, and Shipping

(Section continued from page 371)

Care of Perishable Cargoes

(Continued from Page 371)

1. The cubic feet of air in the hold;
2. Temperature of air entering and leaving the hold;
3. Temperature of the cargo;
4. Humidity of the air entering and leaving the hold;
5. Dew point of the air entering and leaving the hold.

Since these physical laws cannot be avoided, the correct procedure is to seal the ship tight and keep the warm moist air out until such time as the ship has passed from the tropical currents and conditions and is coming up the Atlantic Coast into cold water again.

The process is then reversed, and the ventilators are opened and ventilation is vigorously carried out.

(To be Continued)

Pacific Foreign Trade Council

THE Pacific Foreign Trade Council is drawing delegates from all Pacific Coast cities, including Canada and Mexico, for its Seventh Annual Convention, to be held in Seattle, September 18 to 20, consecutively with the meeting of the Pacific Northwest Advisory Board of the American Railway Association.

A. F. Haines, vice-president and manager of the American Mail Line, is acting head of the Council as senior vice-president, filling out the unexpired presidential term of the late William Pigott. He points out that this organization fills a specific need of the West, by affording the only opportunity for Pacific Coast foreign trade interests to get together and discuss the problems of this particular section in relation to the whole scheme of national enterprise.

More than any other part of the country, the Pacific Coast has a unity of interest in the growth of the entire section. The interests of the cities are interlocked, as they have the same steamship lines serving 260 foreign ports, and they export the same products—fruits, flour, wheat, lumber, minerals, fuel, fish, and dairy products. The foreign trade problems of commercial houses in Los Angeles are identical with those in San Francisco, Portland, Seattle, and Vancouver. The Pacific Foreign Trade Council offers a channel for uniting forces in seeking to open up new fields and creating appetites for the things produced here among people all over the world who do not know and enjoy them. Its chief aim is to stimulate commerce by all available means—in extending foreign markets for Pacific Coast products, as well as in developing trade and industry through the use of imported goods.

To assure the interest of all elements of commerce, the Council arranges its programs to cover the specific needs of the West in relation to agriculture, aeronautics, banking, commercial forestry, taxation, highways, waterpower, transportation, and communications. Speakers are selected from prominent businesses throughout the country and from other nations, thus bringing the western business man in contact with leaders of national and international affairs and helping him to crystallize opinions on matters of importance.

The speakers and delegates coming from Eastern United States and other countries take advantage of the convention to visit all the Pacific Coast cities and obtain a cross-section viewpoint of this part of the country.

In a letter to the council last year, Captain Robert Dollar, veteran foreign trade promoter and a director of the Pacific Foreign Trade Council, expressed himself as follows:

"The work done by the Pacific Foreign Trade Council and the benefit resulting therefrom is not understood by the community at large. First let me say that the importance and benefit of foreign trade to our nation as a whole can hardly be calculated, and that importance and benefit will increase as time goes on."

Improved South America Service

ESTABLISHING a profitable basis for exportation of California grapes to a large new market, the East Coast of South America Conference of steamship lines has announced a drastic reduction in freight rates for fresh grapes in refrigeration. The rate has been cut from \$40 to \$25 per measurement ton on shipments from San Francisco and Los Angeles to East Coast South American ports.

This is expected to place the California product on an equal basis with grapes from Mediterranean countries, which have monopolized the entire consuming market in South America, which takes approximately 4500 tons annually. The market offers still further opportunity for development with high quality California grapes, which are produced in seasons exactly opposite to those below the Equator.

The Westfal-Larsen Line is placing a fleet of five new refrigerator motorships, each with 60,000 cubic feet of refrigerated cargo space, into direct service to Brazil beginning this month. These vessels are each equipped with splendid accommodations for 12 first class passengers, and will be capable of maintaining a sea speed of 14½ knots.

Regular calls at Bahia, Brazil, to facilitate the movement of cocoa beans to the Pacific Coast will be made by all vessels of the Westfal-Larsen Line, beginning with the steamship Evanger. A monthly service from Santos to the Pacific Coast has been maintained by the line for the past three years. With their greater speed, these new ships will permit the delivery of cocoa from Bahia at Los Angeles in 22 days and at San Francisco in 24 days.

Trade, Traffic, and Shipping

(Section continued from page 371)

Care of Perishable Cargoes

(Continued from Page 371)

1. The cubic feet of air in the hold;
2. Temperature of air entering and leaving the hold;
3. Temperature of the cargo;
4. Humidity of the air entering and leaving the hold;
5. Dew point of the air entering and leaving the hold.

Since these physical laws cannot be avoided, the correct procedure is to seal the ship tight and keep the warm moist air out until such time as the ship has passed from the tropical currents and conditions and is coming up the Atlantic Coast into cold water again.

The process is then reversed, and the ventilators are opened and ventilation is vigorously carried out.

(To be Continued)

Pacific Foreign Trade Council

THE Pacific Foreign Trade Council is drawing delegates from all Pacific Coast cities, including Canada and Mexico, for its Seventh Annual Convention, to be held in Seattle, September 18 to 20, consecutively with the meeting of the Pacific Northwest Advisory Board of the American Railway Association.

A. F. Haines, vice-president and manager of the American Mail Line, is acting head of the Council as senior vice-president, filling out the unexpired presidential term of the late William Pigott. He points out that this organization fills a specific need of the West, by affording the only opportunity for Pacific Coast foreign trade interests to get together and discuss the problems of this particular section in relation to the whole scheme of national enterprise.

More than any other part of the country, the Pacific Coast has a unity of interest in the growth of the entire section. The interests of the cities are interlocked, as they have the same steamship lines serving 260 foreign ports, and they export the same products—fruits, flour, wheat, lumber, minerals, fuel, fish, and dairy products. The foreign trade problems of commercial houses in Los Angeles are identical with those in San Francisco, Portland, Seattle, and Vancouver. The Pacific Foreign Trade Council offers a channel for uniting forces in seeking to open up new fields and creating appetites for the things produced here among people all over the world who do not know and enjoy them. Its chief aim is to stimulate commerce by all available means—in extending foreign markets for Pacific Coast products, as well as in developing trade and industry through the use of imported goods.

To assure the interest of all elements of commerce, the Council arranges its programs to cover the specific needs of the West in relation to agriculture, aeronautics, banking, commercial forestry, taxation, highways, waterpower, transportation, and communications. Speakers are selected from prominent businesses throughout the country and from other nations, thus bringing the western business man in contact with leaders of national and international affairs and helping him to crystallize opinions on matters of importance.

The speakers and delegates coming from Eastern United States and other countries take advantage of the convention to visit all the Pacific Coast cities and obtain a cross-section viewpoint of this part of the country.

In a letter to the council last year, Captain Robert Dollar, veteran foreign trade promoter and a director of the Pacific Foreign Trade Council, expressed himself as follows:

"The work done by the Pacific Foreign Trade Council and the benefit resulting therefrom is not understood by the community at large. First let me say that the importance and benefit of foreign trade to our nation as a whole can hardly be calculated, and that importance and benefit will increase as time goes on."

Improved South America Service

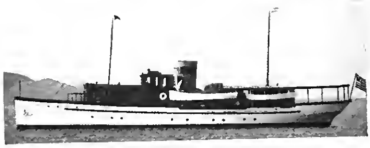
ESTABLISHING a profitable basis for exportation of California grapes to a large new market, the East Coast of South America Conference of steamship lines has announced a drastic reduction in freight rates for fresh grapes in refrigeration. The rate has been cut from $40 to $25 per measurement ton on shipments from San Francisco and Los Angeles to East Coast South American ports.

This is expected to place the California product on an equal basis with grapes from Mediterranean countries, which have monopolized the entire consuming market in South America, which takes approximately 4500 tons annually. The market offers still further opportunity for development with high quality California grapes, which are produced in seasons exactly opposite to those below the Equator.

The Westfal-Larsen Line is placing a fleet of five new refrigerator motorships, each with 60,000 cubic feet of refrigerated cargo space, into direct service to Brazil beginning this month. These vessels are each equipped with splendid accommodations for 12 first class passengers, and will be capable of maintaining a sea speed of 14½ knots.

Regular calls at Bahia, Brazil, to facilitate the movement of cocoa beans to the Pacific Coast will be made by all vessels of the Westfal-Larsen Line, beginning with the steamship Evanger. A monthly service from Santos to the Pacific Coast has been maintained by the line for the past three years. With their greater speed, these new ships will permit the delivery of cocoa from Bahia at Los Angeles in 22 days and at San Francisco in 24 days.

One of the master's bedroom staterooms on the Sobre Los Olas, showing bed furnished with Simmons Coil spring and Simmons Beautyrest mattress



The Sobre Los Olas, one of the Pacific's newest palatial yachts, has Simmons equipment

Owners of fine yachts also prefer this equipment

Like many famous liners, the Sobre Los Olas has Simmons springs and mattresses

* * *

Her maiden voyage only recently completed, the Sobre Los Olas now has taken her place at the head of the rapidly growing pleasure fleet of the Pacific Coast.

A palatial craft — 101 feet long — powered by twin Diesel engines—with a cruising radius of 4,500 miles!

In every detail, the Sobre Los Olas shows that trim perfection which steamship men admire. She has so much that they themselves approvingly buy and use—such as Simmons Coil Springs and Simmons Beautyrest mattresses, famous for comfort, famous for low maintenance costs.

Whether your problem is to equip a plodding freighter or a speedy yacht, Simmons equipment is your answer. May we advise you?

The SIMMONS COMPANY

295 Bay Street, San Francisco

SEATTLE PORTLAND OAKLAND LOS ANGELES

California Gasoline Through the Canal in 1929

CALIFORNIA gasoline shipments may exceed 30,000,000 barrels through the Panama Canal in 1929. In any event they are certain to set a new record for volume. Definite commitments of shipping companies exceed 26,300,000 barrels, as compared with total movements through the canal in 1928 of 25,226,000 barrels, a record of the past.

Most commitments represent inter-company business, such as General Petroleum Corporation, supplying the parent Standard Oil Company of New York; Associated Oil Company, shipping to the Tide Water-Associated Oil Company; The Texas Corporation, shipping to itself, and so forth.

There are outside movements, however, as represented in Union Oil Co. of California sales to Atlantic Refining Co.; Standard Oil Co. (Calif.) shipments to large eastern buyers, and Richfield Oil Company's general sales, in addition to supplying its expanding eastern outlets. Richfield recently bought the Walburn Petroleum Corp. and has acquired other outlets in New England, New York, New Jersey, Pennsylvania, and Maryland, shipping in its own tankers.

Gasoline shipments through the canal in the three months period of 1929 totaled 7,528,000 barrels, according to the United States Bureau of Mines. The 5,108,000 barrels shipped to Atlantic Seaboard destinations compared with 3,132,000 barrels shipped in the corresponding period last year, an increase of 63.09 per cent. Atlantic foreign shipments through the canal totaled 2,420,000 barrels, compared with 1,442,000 barrels, an increase of 67.82 per cent.

Information based on California port records indicated April shipments to Atlantic Seaboard destinations had increased to nearly 68,000 barrels daily for the first four months of 1929 as compared with 56,750 barrels daily average shown by Bureau of Mines figures for the first quarter.

Intercoastal gasoline commitments for 1929 are shown to approximate 16,150,000 barrels. Last year total gasoline shipments were 16,778,000 barrels. Atlantic foreign port commitments on gasoline approximate 10,150,000 barrels. Fuel and gas oil commitments total 4,600,000 barrels, of which intercoastal contracts will take 3,525,000 barrels and export 1,075,000 barrels. Refinable crude commitments amount to less than 500,000 barrels.

Western exports, that is to say shipments to Asia and Pacific destinations, totaled 1,710,000 barrels in the 1929 first quarter as compared with 1,542,000 barrels a year ago, or an increase of 10.89 per cent. Their total throughout 1928 was 6,798,000 barrels.

—National Petroleum News.

Freights, Charters, Sales

August 21, 1929.

THE following steamers have been reported fixed with grain to U.K./Continent: A K Line steamer from Portland or Puget Sound to U.K. Continent, 28 6; Aug./Sept., Balfour, Guthrie and Co.; a Smith steamer, Portland or Puget Sound to U.K./Continent, 28/6, J. W. Mitchell, Ltd.; British str. Rio Blanco, Portland or Puget Sound to U.K./Continent, 28 9, Sept., L. Dreyfus and Co.; British str. Bradfyne, Portland or Puget Sound to U.K. Continent, 28/3, Aug./Sept., Strauss & Co.; British str. Kilnsea, Portland or Puget Sound to U.K. Continent, 28 6, Aug./Sept., Strauss & Co.; British m.s. Glenmoor, Portland or Puget Sound to U.K./Continent, 28 3, Aug., Balfour, Guthrie & Co.; Norwegian m.s. Indra, Portland to U.K. Continent, Aug., Balfour, Guthrie & Co.; British str. Madras City, Portland or Puget Sound to U.K. Continent, 28/6, Sept., J. W. Mitchell, Ltd.; British str. Innesmoor, Portland to U.K. Continent, Sept., Kerr, Gifford & Co.; Japanese str. San Francisco Maru, Portland to U.K. Continent, 28/6, Aug./Sept., Balfour, Guthrie & Co.; British str. Trewidden, Columbia River to U.K. Continent, prompt, Kerr, Gifford & Co.; British str. Benvrakie, San Francisco or Portland to U.K.-Continent, Aug., Strauss & Co.; British str. King Edwin, Portland to U.K. Continent, 28 -, Aug., Kerr, Gifford & Co.; Japanese str., Portland or Puget Sound to U.K. Continent, 28 3, Sept./Oct., Strauss & Co.

A Japanese steamer has been fixed with lumber from two ports North Pacific to two ports Australia, $12.25, Sept., by American Trading Co.

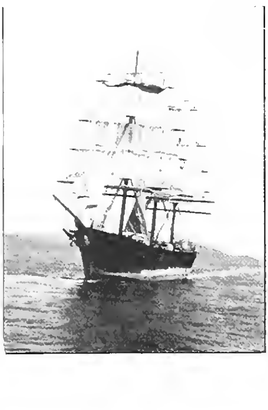
The following steamers have been reported fixed with lumber to the Orient: Japanese str. Erie Maru, Grays Harbor to Japan, August, Yamacho & Co.; a Japanese str. from North Pacific to Japan, Oct., Yamacho & Co.; Japanese str. Milan Maru, British Columbia to Japan, Sept., Yamacho & Co.

The America str. Ethel M. Sterling has been fixed with lumber from British Columbia and Puget Sound to Tonga Islands, prompt, by Morris Hedstrom & Co.

The following time charters are reported: Norwegian str. Tyr, one trip San Francisco to Melbourne and Sydney (sublet), Aug., Union Steamship Co.; Norwegian str. Kalfarli, two trips San Francisco and North Pacific to Australia, case oil and lumber, Aug., J. J. Moore and Co., British str. Barrgrove, one trip, delivery British Columbia, redelivery U.K. Continent, Sept., W. L. Comyn & Co.

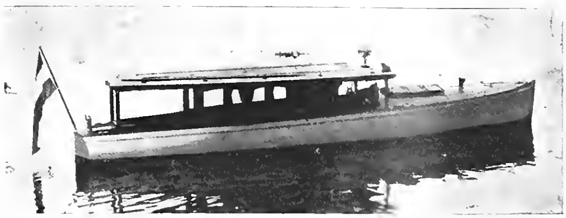
The following sales have been reported: American tank steamers Torres, Topila and Tamiahua from Southern Pacific Co. to Richfield Oil Company; concrete steamer Peralta, Ocean Industries to Bethlehem Shipbuilding Corp.; American steamers Claudine and Helene from Inter-Island Steam Navigation Company to Crowley Launch and Tugboat Company.

PAGE BROTHERS, Brokers.



Pacific Coast Workboat Notes

(Continued from Page 377)



The Zwaluw, a smart cruiser built for the Royal Dutch Shell Petroleum Company by The Industrial Company of Palembang, Sumatra. 36 feet long, 6 feet 3 inches beam, 3 feet 6 inches draft, she is driven easily at 25 miles an hour by a Chevron Model, 6-cylinder, Sterling gas engine.

merly Madhatter, owned by K. A. Lundstrom) has been completely overhauled and equipped with Lux fire extinguishing system.

Al Larson, boat builder, with plant at Terminal Island, San Pedro, has recently completed the purse seiner Conquest for Nick Mezin and Steve Kollooper of Monterey, California. The boat is 75 feet long, 18 feet beam, 10 feet depth. She has accommodations for a crew of 10. Power is supplied by a 160-horsepower **Western-Enterprise** diesel engine.

This yard recently completed a fine new purse seiner and livebait fishing boat for sardines and tuna for Captain Y. Masuno. This boat is to be called the Geneva and will be 80 feet long, 20 feet beam, 10 feet depth. She is to be powered with a 200-horsepower **Atlas-Imperial** diesel engine. Her fuel tanks will give her a cruising radius of between 4000 and 5000 miles at a speed of 10 to 10$\frac{1}{2}$ knots. The Geneva will be equipped with a **Lipman** refrigerating machine and two 5-inch **Byron-Jackson** pumps for pumping fresh sea water into the bait tanks. She will have two emergency gas engines.

San Pedro Boat Building Co., Terminal Island, San Pedro, has just completed the fine new tuna fishing boat, the Cipango, for Y. Nakasuji of San Pedro. This boat has a length of 100 feet, with raised deck, a beam of 25 feet, and depth of 10 feet 6 inches. She is powered with a 375-horsepower **Western-Enterprise** diesel engine to give a speed of 12 knots. Other equipment on this boat are a **Lipman** refrigerating machine and **Byron-Jackson** pumps. She has accommodations for 12 men and her galley will be equipped with a **Shipmate** stove.

World's Largest Lifeboat

PRINCESS MARY, the largest lifeboat in the world, was recently placed in commission by the British Royal National Lifeboat Institution. This is a boat built by S. E. Saunders, Ltd., of Cowes, England, and was financed out of the $75,000 gift of the Peninsular and Oriental group of shipping companies to the Royal National Lifeboat Institution in response to an appeal made by the Prince of Wales last year.

The boat is 61 feet long with 15 feet beam and has 15 main and 100 minor water-tight compartments. The hull is sheathed with two thicknesses of teak. Ready for work she has a displacement of 45 tons and an excess buoyancy of 67 tons. She is fitted with two cabins which have each a capacity for 50 to 60 people. In calm weather she can take 300 people on deck and under severe bad weather conditions she can take care of 150 people in addition to the crew.

The power plant consists of two of the Royal National Lifeboat Institution, 6-cylinder, gasoline engines, 5$\frac{1}{2}$ inches bore and 7-inch stroke, each developing 80 horsepower at 800 revolutions a minute. The propellers are three-bladed, 25 inches in diameter by 23-inch pitch, and this equipment is capable of driving the boat at 9 to 10 knots under any weather conditions. The engines will work satisfactorily even when entirely submerged provided the air inlets are above water. The engines themselves, are completely water-tight and are housed in completely water-tight compartments. The gasoline tankage provided is sufficient for a 500-mile cruising radius at a speed of 8 knots. The auxiliary equipment consists of a 1$\frac{1}{2}$-kilowatt gasoline engine driven electrical generating set operated in conjunction with several large capacity storage batteries. Fire extinguishing apparatus is provided in all compartments and apparatus is

The Princess Mary, said to be the world's largest life-saving craft. In any kind of weather she can take care of 150 people in addition to her crew.

installed forward for spraying oil on heavy seas.

The Princess Mary, besides a line-throwing gun and an electrically driven windlass and two anchors, is provided with electrical searchlight and with a special life saving net, into which persons from vessels can jump as the lifeboat lies alongside.

Three lifeboats of this type in smaller editions are already in service, being stationed at New Brighton, at Plymouth, and at Aberdeen. The Princess Mary will be stationed at Pasdow, Cornwall.

Seattle. General Construction Company of Seattle has been awarded contract for the rebuilding of the Union Pacific Dock, which was badly damaged by fire recently.

Pacific Marine Review

The National Magazine of Shipping

OCTOBER, 1929

Official Organ

Official Organ
SHIPOWNERS' ASSOCIATION

Pacific Marine Review, Vol. 26, No. 10, Published Monthly at 576 Sacramento Street, in San Francisco, Entered as second class matter at the post office at San Francisco under the act of March 3, 1879.

Pacific Marine Review

VOLUME XXVI OCTOBER, 1929 NUMBER 10

The International Hydrographic Service

By Rear Admiral A. P. Niblack
U.S. Navy (Retired),
President of the Directing Committee of the International Hydrographic Bureau, Monaco.

THIS posthumous paper (its author having died suddenly on August 20th) was read before the 18th Annual Safety Congress at Chicago October 1st by Rear Admiral W. S. Crosley, Commandant of the Great Lakes Naval Training Station. Like many other national and international services, the International Hydrographic Service is doing a very quiet but none the less a great task which is little known or appreciated by even the professional mariner, who directly profits thereby.

The International Hydrographic Bureau has its offices in the Principality of Monaco, and has 23 different Maritime States members who support it by contributions based upon their combined merchant ship and man of war tonnage, with corresponding votes. For instance, Great Britain pays 17 units and has 17 votes; the U. S. A. pays 15, and has 15 votes. Other countries have nine, eight, seven, etc., down to two, which is the minimum for such countries as Siam, Poland, Monaco, Egypt, etc. All these States, and many others not members yet, have hydrographic offices which publish charts of their coasts and inland navigable waters, sailing directions, light lists, buoyage lists, current charts, tide tables, etc., which they sell at a nominal price; also many books and pamphlets to aid navigation in all the seas of the world.

It is the function of the International Hydrographic Bureau to study the documents published by these Hydrographic Offices; to attempt to bring about uniformity in abbreviations and conventional signs employed on marine charts; to improve the methods of hydrographic surveying; to publish the results of their hydrographic work; and list of work to be undertaken and give all the details; to study the construction and use of hydrographic instruments; and to engage in such research work as will further the interests of hydrography and safety in navigation in all the seas of the world. It endeavors to co-ordinate the hydrographic work; to encourage surveys to be made in unknown sections of the world; to persuade the various offices to adopt the proposals of its periodic international conferences; and to obtain uniformity in all hydrographic documents.

In short, it is endeavoring to bring about and place in the hands of the shipmaster and navigator, all the information which he should have for safe navigation. Every country in the world seems to be working in water-tight compartments with regard to its port and coastal signals; signals for life saving on the coast, etc., and there are even 26 different systems of buoyage and of storm warning signals in the world.

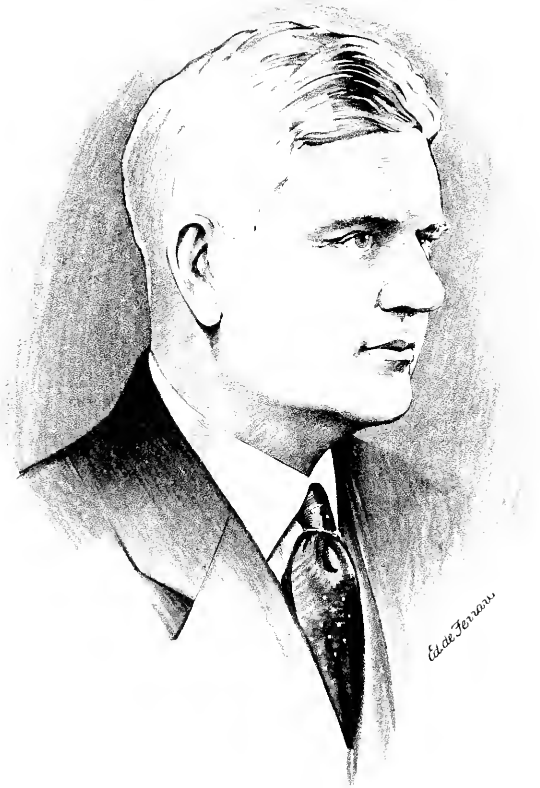
Radio has brought about many important improvements in the aids to navigation, but, broadly speaking, this Bureau is more interested in visual signals and aids which the man on the bridge can see, or hear, as distinct from data which are received in the radio room by an operator.

This Bureau owes its origin to suggestions made at several maritime conferences by M. Renaud, French hydrographer, for the necessity of an International Central Bureau, and this idea was taken up by the British hydrographer, Admiral Sir John Farry, and it was subsequently, owing to the generosity of the British Government in calling an International Hydrographic Conference in London, in 1919, that this Bureau was organized in June, 1921, with 21 States members, and took up its work at Monaco in September of that year.

The work of the National Safety Council in America has been beyond all praise. With regard to the Marine Section, in particular, it is a curious fact that its horizon has been limited to providing the elements of safety within the ship itself. After the loss of the Titanic, in 1912, the British Government called a conference in London on "Safety of Life at Sea," and that distinguished body seemed to be obsessed with the idea that it was its business to provide better ship construction, to improve appliances in case of accidents, and to suggest better signals of distress and better life-boat equipment for the protection of the ship and passengers. Its proposed convention was adopted only by five countries of the world on account of the World War beginning a few months after the meeting.

Our Bureau is interested in providing for safety of both life and property at sea, and the avoidance of accidents is its cardinal principle. As compared with the Marine Section it stands on the bridge of a ship, looking ahead, to provide safety in navigation by instruments within, but also by necessary knowledge of conditions outside the ship. On the other hand, the safeguarding of people, as viewed by the Marine Section and the London Conference referred to, seems to be that of a man on the bridge of a ship providing safety entirely from within. In the one case, this Bureau is scanning the horizon, and in the other, the chief officer is seeing that everything is secure within the ship.

After the sinking of the Titanic, in her collision with an iceberg, on April 15, 1912, near latitude 41 degrees 46 minutes North and longitude 50 degrees 14 minutes West, North Atlantic Ocean, an investigation was held; and, at the convention that was called in London in



Roger D. Lapham

By heredity through several generations a thoroughbred American and an ardent lover of ships, Roger D. Lapham is by training and choice a hard worker, a keen student, a public spirited citizen, and a great golf enthusiast. Small wonder, then, that at the age of forty-five he is hailed as America's youngest major steamship executive—President of the American-Hawaiian Steamship Company operating forty-two American cargo liners with a combined deadweight capacity of 419,678 *tons.*

1914, an international agreement was reached for the equipment of an ice patrol in the North Atlantic Ocean, along the summer routes of travel, which patrol has been carried on by the United States Coastguard—the expenses being jointly paid by a number of countries. The London Convention agreed upon by the conference, and afterwards signed by only five countries, took active measures to improve the water-tight subdivisions of ships; the S. O. S. and other radio calls for assistance, the efficient equipment of life boats and other attempts to lessen the dangers arising from such collisions. It did not seek to remedy the dangers of collisions at sea by modernization of the "Regulations for Preventing Collisions at Sea."

One is apt to think that the Titanic was lost through a failure to know of the ice conditions in the North Atlantic at the time. As a matter of fact, in 1912 there were 1.200 icebergs known to traverse the steamer routes in the North Atlantic; the average is about 350 a year. There have been known to be as few as 22, and as high as 2,200.

The U. S. Coastguard has so conducted its researches in connection with icebergs from the Polar Seas that it has now become almost an exact science, as each dangerous iceberg is tagged and followed. At 9 a.m. on the morning of April 12, Captain Smith of the Titanic received from the Coronia reports of ice growlers and field ice in the region in which the Titanic afterwards struck, and Captain Smith acknowledged the receipt of the message. At 1:42 p.m. the steamship Baltic wirelessed Captain Smith, reporting icebergs and large quantities of field ice within a few miles of where the Titanic struck. Captain Smith acknowledged the receipt of this message. Mr. Bruce Ismay, the managing director of the White Star Line, who was on board the Titanic, also read the Baltic's message, because it was handed to him by Captain Smith, and he afterward testified that he understood from the message that they would arrive in the region of the ice that night. Mr. Ismay showed the message to other passengers, but it remained in Mr. Ismay's possession until 7:15 p.m., when it was first posted in the chart room. At 1:45 p.m. on the 14th the German steamer America wirelessed the Hydrographic Office in Washington that she had passed two large icebergs 41 degrees 27 minutes North, and 50 degrees 8 minutes West on the 14th of April. The Titanic relayed this message to the Hydrographic Office in Washington through the radio station at Cape Race. At 7:30 p.m. of the 14th, the steamer California radioed to the Antillian (picked up by the Titanic): "6:30 p.m. ship's time, latitude 42 degrees 3 minutes North, longitude 49 degrees 9 minutes West, three large icebergs five miles to southward of us." There was a fifth message received by the Titanic at 9:40 p.m. from the Mesaba, saying: "To the Titanic and all East-bound ships, ice reports latitude 40 degrees North to 41 degrees 45 minutes North, longitude 49 degrees to 50 degrees 30 minutes West, much heavy pack ice and a large number of great icebergs, also field ice. Weather good and clear." Certainly, at that time there was nothing wrong with the ice warnings in the North Atlantic Ocean.

As the Convention of "Safety of Life at Sea" drawn up in London in 1914 has been approved by only five countries, Great Britain called an exactly similar convention to meet in London on April 15, 1929, which adjourned in June of this year. It seems to have been equally anxious as regards boat equipment, floatability, water-tight compartments, signals of distress, etc., and whether it will take a broader view as to safety of life at sea being equally dependent upon avoidance of collisions is at this time difficult to say.

The United States has gone rather further than other maritime nations in the compulsory use of safety devices and regulations for merchant ships. For one thing, it is the only Government that insists that each ship shall carry a line-throwing gun for cases of need. Our Government will, therefore, be found to have gone further in the London Conference in proposals for new devices and more stringent codes. This puts a further handicap on American shipping, of which there are already so many that it is a wonder that it exists at all.

The Germans have made some wonderful inventions in life-saving rafts and lifeboats in recent years, and the London Conference is sure to have brought about some betterment in types of lifeboats and life-saving rafts.

The object of this paper is to call the attention of the Marine Section to the Reports of the results of the London Conference, April 15 to June 15, 1929, on "Safety of Life at Sea." No matter what else they will have done at this Conference, they will have ignored many of the suggestions of this Bureau—which, however, will not cease its efforts to bring about in the future improvements in methods of life-saving signals, danger warnings, and uniformity in aids to navigation, all of which tend to reduce the loss of life and property at sea.

Meanwhile, this Bureau offers for sale at prices merely covering the cost of printing many pamphlets and tabulations of data, with a view to securing uniformity in all those matters which concern the adoption of uniform methods to take the terrible strain off the masters of the ships in the matter of encountering different signals for every different coast and port of the world.

Lists of these publications have been sent your secretary, some of which may lead to a wider view being taken of the activities of the Marine Section.

Twenty-Five Years Ago

PACIFIC MARINE REVIEW, then published in Seattle, opened its October 1904 issue with a fine leading article on the launch of the U.S. battleship Nebraska at Moran Bros. Shipyard, which was, up to that time, the greatest shipbuilding event of the Pacific Northwest.

It was shown that a 7500 deadweight ton carrier fitted with Scotch boilers and triple expansion reciprocating engines could be built for $187,000 in England to British specifications, but would cost $300,000 built in Seattle to American specifications.

It was reported that the American-Hawaiian Steamship Company proposed to install oil burners in all of its steamers, withdrawing them from service for conversion as occasion permitted. This company had contracted with the Standard Oil Company to supply their steamers with bunker stations on the Atlantic seaboard.

With characteristic boldness it was demanded that one of the three new naval vessels for which appropriation had been made should be awarded to Moran Bros.

Sea Safety Concepts of a Seaman

By Captain Thomas W. Sheridan

THE address of which this article is an abstract was delivered before the Marine Section of the 18th Annual Safety Congress. It sets forth some very interesting observations on sea safety from the standpoint of the navigating or executive officer of the ship. These observations have a direct bearing on the necessity for more school ships.

Despite Progress Accidents Still Happen at Sea

Since the dawn of navigation constant effort has been made, greatly accentuated in the last century, to attain safety at sea. In every phase of maritime activity scientific research and inventive genius have supplied instruments, machines and methods which should theoretically almost absolutely eliminate accidental disaster at sea. But still accidents do happen with disturbing frequency. That they do happen is an indication of a weak link in the safety chain, and I am certain that this is to be found in the frailty of the human operating element; in other words, to dumbness, incompetency, recklessness, or a combination of some or all of these characteristics.

Every exertion is devoted to the development of each phase of shipping efficiency except—curiously—one of the most vital factors requisite in attaining the maximum in sea safety conditions. For while research, invention and ingenuity have been exploited to the utmost in providing mechanical and material accident preventatives little is done (except the maintenance of three small schoolships) to educate, train and prepare for their responsibilities the men responsible for the operation and safety of the costly craft composing our mercantile marine. This is a vitally important factor in sea safety, for I believe that there is no doubt that the vast majority of recent sea disasters have been due to dumbness on the part of the officers involved.

Narrow Escape Provides Eloquent Lesson

Years ago I had an eloquent example of the damage dumbness in authority can do when I drifted a week in the wintry seas of the North Pacific in a ship on her beam ends. This ship was a four-masted barque—one of the finest and largest of its kind ever constructed in this country. We were bound from Japan to the Columbia River in ballast. While the ballasting was in progress I had observed that the stowage was improper and thereupon protested to the mate, but, as I was only the third mate and 18 years old, he told me to "choke the luff of my jaw tackle." It was the shifting of this ballast in a gale, due to poor stowage, that hove the ship on its beam ends with a very narrow escape from capsizing. We lost all the boats, some sailors and a lot of gear. Only by cutting the topgallant masts (the topmast and lower were in one piece) out of her did we save the ship. I may add that I myself was washed overboard but managed to swim alongside and get hold of the end of a brace until the next wave brought me back aboard.

Deadly Dumbness on the "Deep."

A recent loss of a foreign liner loaded with American cargo and passengers—as most foreign liners seem to be when they get into trouble—was a complete classic exhibition, with the dramatic inevitability of a Greek tragedy, of the destructive possibilities of the "Demon of Dumbness." Here there appeared to be, on the part of the officers and captain, a complete cessation of cerebration, right from the inception of the trouble.

Of course, many factors contributed their share in causing this catastrophe—negligence, stupidity and recklessness in maintenance, repair and loading the ship, etc. But the major contributing cause was the mistakes and errors made due to an almost unbelievable ignorance of the simplest fundamentals of ship stability considerations.

Still more astounding is the general ignorance concerning this important phase of professional knowledge in our own mercantile marine. And that again emphasizes the fact that there has been, and is, grave neglect of the subject of the training and education of the officer personnel—deck and engine—of our merchant ships. While many of the officers of this service have attained, either through self-education or otherwise, unexcelled professional competence and, as a body, the merchant marine officers of the United States compare favorably with those of any other nation, yet it must be confessed that there is a great need for a proper system of a selection, training and education if standards of safety and efficiency are to be attained and maintained.

Present System of Officer Development

Very often an officer is produced by the following process: Starting with less education than that given by the lower grammar schools, he spends a couple of years (two is the legal requirement) chipping iron rust, washing paintwork, and performing other jobs with little or no technical training or experience—as an ordinary seaman or boy, and then takes his examination for an officer's license, after a short time spent in cramming to prepare to answer the simple questions asked in (necessarily) superficial and elemental navigation and seamanship. The possession of this license entitles the holder to take charge of a watch on the bridge of the largest ship afloat. Very frequently such men acquire dexterity, by experience, in the immediate requirements of the various positions they occupy in a rise to command which they attain without any comprehension of the scientific mathematical and theoretical foundation of the arts employed in the operation of the craft under their charge. This condition, in my opinion, accounts for many of the otherwise inexplicable sea disasters.

A curious illustration of ignorance, on the part of men of long experience, of the important science of ship stability was given by one of the "experts" who discussed this recent disaster in an evening paper. This "expert," a man of long experience, evidenced by his articles in the paper that he could not define one of the simplest points in metacentric stability. I also have frequently met men of long experience, as officers, who did not understand and could not compute simple but important calculations connected with the safety of their ships.

Training, Education and Indoctrination Are Safety Essentials

To obtain ideal safety conditions at sea it is of course obvious that the first essential is that ships be officered

—deck and engine room—by soundly educated practical men. This does not mean that the examination for licenses should just be made stiffer, as the only result would be that the candidate would spend that much more time in a cramming school learning things which he would hardly understand and soon forget. The only solution is (as in most professions) to provide liberal facilities for the attainment of the major safety essentials—training, education and indoctrination.

In the fulfillment of its occult purpose in impelling the species to its ultimate destiny Nature, in ruthlessly sacrificing the individual, seems to abhor caution and to have endowed mankind with an urge for pure recklessness. War, aviation, exploration and marriage are yet popular enough to indicate mankind's reckless zest for hazardous activities.

The will to "take a chance" is one of the primal urges of human nature to which paramount consideration should be given in planning the psychological phase of any course of safety instruction. The quite essential spirit of emprise should be deftly and intelligently developed away from becoming one of foolhardy, stupid recklessness. Mere dicta is insufficient and sometimes is detrimental, in that it acts as an irritant to the recklessly inclined. An indication of this is the challenge which the introduction of safety appliances seems sometimes to offer to a certain type of man who will take a chance up to the limit of the estimated factor of safety and then seize upon the greater calculated degree of safety to take more risks. Locky points this out when he refers to rocks which suddenly became dangerous through captains skimming close to them in steamers, but who would have kept well clear of them in sailing ships. Thus steam, although safer, paradoxically led to danger on account of the greater chances taken.

Booze Blamed for Personal Injuries

Concerning the question of personal injury of seamen (all men shipped are technically seamen) it is my experience that the vast majority of accidents are due to booze. Of course, fortuity, stupidity, incompetence and recklessness account for a share. I am convinced that the major reason why ladder and hatch accidents loom so large in the casualty statistics is because activities connected with them generally take place in port where booze is obtainable. A soused sailor on a ladder—or handling one for another—presents a case where iodine, splints and bandages will be urgently required.

Recently I made several voyages around the world in command of a motorship. We had practically no seamen sick or injured until the booze area was struck. The first five weeks—on the American Coast—were peaceful, for (while the local inhabitant of a village may be able to get booze in the U. S.) the roving sailor is distrusted in the speakeasys and thus usually remains quite sober. However, my crew, as all crews of all nations seem to do, made up for it when they reached the wet regions, with a resulting harvest of bruises, sprains, cuts, backaches and sickness.

A couple of ship's cooks and a bos'n offered—among many others—good material "to point a moral or adorn a tale"; in fact, many tales. No trouble with them until we reached Australia. There the rum flows freely and the bibulous ambitions of seamen receive statutory cognizance in a law requiring ships to stretch nets between the docks and the ships to save the dropping drunks from drowning as they trip in trying to get aboard. Brisbane was the first port touched at, and from there on, round Australia to India, Ceylon and to Suez, these gentlemen had used on them (or caused to be used on others) vast quantities of iodine, bandages, catgut and medical services. At Sydney, in a convivial discussion, the second cook socked the bos'n with a meat axe and stove in three of his ribs. As this left the bos'n only able to work with one side—fortunately the right—and he was therefore calculated to be only 50 per cent efficient, the cook was charged half of his wages and subsistence (to make up for the loss to the ship) and the cost of the medical repairs.

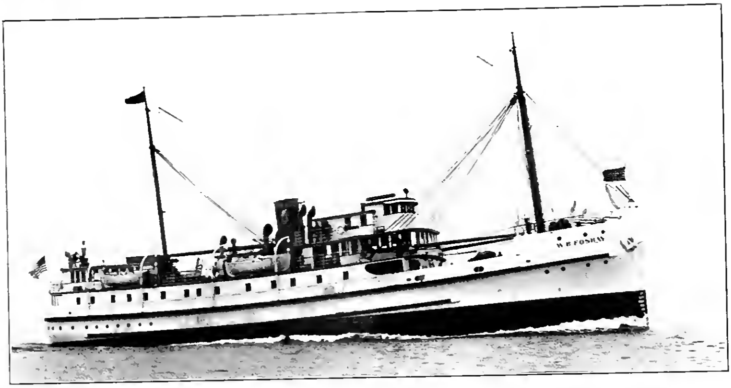
A Cook's Tour in the Bay of Bengal

It was the chief cook who rose to heights of eccentric eminence. He had devoted himself to a serious endeavor to down the available supply of Australian and Indian booze, trying everything at least once, so that by the time we reached Calcutta he was rather bored with the stuff and sought for new sensations. On the way from Calcutta to Ceylon he tried something new. This was a punch made of a mixture of the ship's vanilla extract, some bay rum, and Worcestershire sauce. We were about a thousand miles out, in the middle of the Bay of Bengal when he experimented with this stuff. That it was potent was evidenced rather strikingly when he came out on deck and announced that he was going to swim back to his girl in Calcutta and then dove over and started back. He was a rotten cook but we stopped and picked him up with a loss of twenty-one minutes. As it was feared he might experiment with the food, he was discharged at Ceylon three days later. By this time, having spent three days in the ship's brig, he was nearly sober and (though rather anxious to get off the ship) was very indignant when informed that the cost of his performance (amounting to five dollars a minute) was to be charged against him. Even when it was pointed out that this gave him the distinction (rare in cooks' careers) of having chartered a two million dollar ship for a yachting cruise for the twenty-one minutes, he was not consoled.

A drastic program of eliminating, as far as practicable, all drunks from the sea service would, in my opinion, be the most effective agent in reducing the personal accident damage aboard ships, or if that cannot be totally achieved then by making it a rule to remove from the vicinity of any hazardous (or potentially so) job any man showing the slightest evidence of having booze aboard. A couple of drinks in a sailor seems to remove all his sense of caution and make him a menace to himself and others. The total drunk is really safer than the man with a couple of drinks. A little booze seems to have the effect of making otherwise lethargic individuals dangerously active. Of course it should also be kept in mind that many of the injuries claimed to have been received accidently in the line of duty are really the result of drunken brawls, as I have very often found on investigation.

Foundation of Philosophy of Sea Safety

While no aspect of the subject should be neglected and every resource of invention and precaution should, in both building and operation of the ship, be utilized to the fullest extent, yet in the final analysis it must be realized that the foundation of a sound system of sea safety philosophy rests upon the proper selection, intelligence, training, education, indoctrination and sobriety of the officers and men who man the ships.



The Motorship W. B. Foshay

New Steel, Twin-Screw, Diesel-Driven Coastwise Cargo and Passenger Vessel for the Seattle-Alaska Run

THE Lake Washington Shipyards of Honghton, Washington, have recently held successful test runs on the new steel motorship W. B. Foshay and have delivered her to the Northland Transportation Company of Seattle.

The W. B. Foshay was designed by Lee & Brinton, naval architects, of Seattle and San Francisco, especially for the Seattle-Ketchikan run. She is of all-steel construction with forged steel stem and rudder post, and was designed and built to the highest class of the American Bureau of Shipping and to conform to all rules and regulations of the United States Steamboat Inspection Service for passenger and refrigerated cargo service.

Her principal characteristics are:

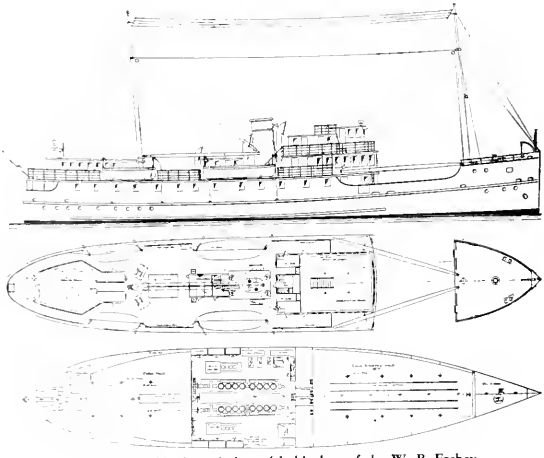
Length	186′0″
Beam, molded	35′0″
Depth molded	21′6″
Passenger capacity	54
Freight capacity, cubic feet	37,000
Power on twin screws, shaft horsepower	1,120
Speed in knots	12

As will be noted from the inboard profile herewith, the hull has two complete decks and a two-island superstructure. Below the main deck, the hull is divided by five watertight bulkheads into six water-tight compartments. From forward aft, these comprise the fore peak, which is arranged as an oil cargo tank; the large cold storage hold space; the fuel oil bunkers; the engine room; the after cargo hold; and the after peak tank.

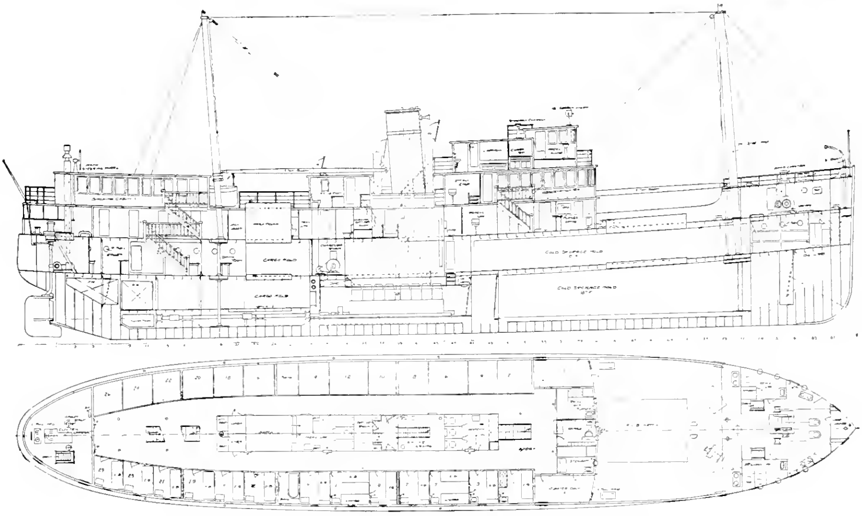
Passenger Accommodations

Passenger staterooms are arranged on the upper deck. All are outside rooms with large window lights and opening on to an interior corridor which, forward and aft of the hatch trunk and engine room trunk, forms a spacious lobby.

Stateroom bulkheads and ceilings in way of state rooms and public rooms are formed of veneer made by the Wheeler Osgood Company of Tacoma and formed into double panels with deadening felt between. In all of the public spaces this paneling is finished in Philippine mahogany to match the built-in furniture. In the stateroom interiors the



Outboard profile, boat deck, and hold plans of the W. B. Foshay.



Inboard profile and passenger accommodation plan of the W. B. Foshay.

finish is fir. All stair railings, moldings, and battens in the public spaces are in Philippine mahogany. The treatment is such as to create an air of rich simplicity. All steel decks in way of lobby and staterooms are floored with tongue and groove, vertical grain pine flooring. The dining saloon floor is covered with Raecolith composition flooring turned up on ends and sides to a 4-inch coaming, making a sanitary water-tight floor.

The galley is equipped with Ray oil-burning range manufactured by the W. S. Ray Manufacturing Co. of San Francisco, a water-heated serving table, ample locker space, and the usual electric fixtures for short orders.

Machinery

The propulsion machinery installation on the W. B. Foshay consists of two 8-cylinder Washington-Estep, airless injection, directly reversible, marine type diesel engines, each directly connected to a propeller shaft. These engines are $14\frac{1}{2}$-inch cylinder bore by 18-inch stroke, and each develops 560 brake horsepower at 250 revolutions a minute. On trial, these engines easily made the required power to drive the hull at a speed of better than 12 knots, and showed very gratifying ability in maneuvering. For auxiliary power and lighting there are installed two 4-cylinder, 75 brake horsepower Washington-Estep diesels, each direct-connected to a 50-kilowatt, 125-volt, General Electric direct-current generator. These engines are of the non-reversing type with cylinders $8\frac{1}{2}$ by 10 inches.

All of the auxiliary machinery on the W. B. Foshay is electrically operated, and the power requirements include: One 20-horsepower motor for fire and bilge pump; two 10-horsepower motors for auxiliary machinery; two 20-horsepower motors for winches; two 10-horsepower motors for winches; one 20-horsepower motor for windlass; a 5-horsepower motor for oil transfer pump; a 10-horsepower motor for capstan; and a 6-horsepower motor for steering gear.

The windlass, four cargo winches, the capstan, and the steering gear are all of the well-known Allan Cunningham electric type manufactured by Allan Cunningham of Seattle.

Clean lubricating oil for the diesel engines is assured by the installation of a De Laval, motor driven, type No. 302 oil purifier, which receives the dirty lubricating oil from a 30-gallon tank connected to the lubricating system of the engines and returns clean lubricant to engine's pumps.

A second De Laval oil purifier takes care of the fuel oil used in the main and auxiliary power plant.

Communication between the pilot house and the engine room is provided for with Cory standard engine room telegraphs, Cory anti-noise telephones, and the Cory revolution indicators.

The Lake Washington Shipyards and the Washington Iron Works have combined to make the W. B. Foshay a complete, economical and serviceable passenger and cargo motorship, the largest and best motorship.

SHIPOWNERS ELECTION

At the annual meeting of the Shipowners' Association of the Pacific Coast held at San Francisco, September 26, F. J. O'Connor was re-elected president, R. W. Myers and James H. MacLafferty were re-elected vice-presidents, and Nat Levin was re-elected secretary-treasurer.

Following are Board of Directors elected:

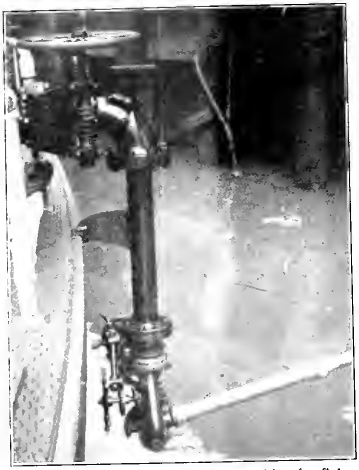
F. J. O'Connor, Donovan Lumber Co.; R. W. Myers, Hobbs Wall & Co.; James Tyson, Nelson Steamship Co.; S. M. Hauptman, McCormick Steamship Co.; L. C. Hammond, Hammond Lumber Co.; Otis R. Johnson, National Steamship Co.; L. C. Stewart, Sudden & Christenson; S. D. Freeman, S. S. Freeman & Co.; H. F. Vincent, E. K. Wood Lumber Co.; W. R. Chamberlin, W. R. Chamberlin & Co.; John L. Reed, J. R. Hanify Co.; and John C. McCabe, A. F. Mahony Co.

Tacoma's New Floating Fire Fighter

Coast Line Shipbuilding Company Holds Successful Tests on Tacoma Fireboat No. 1

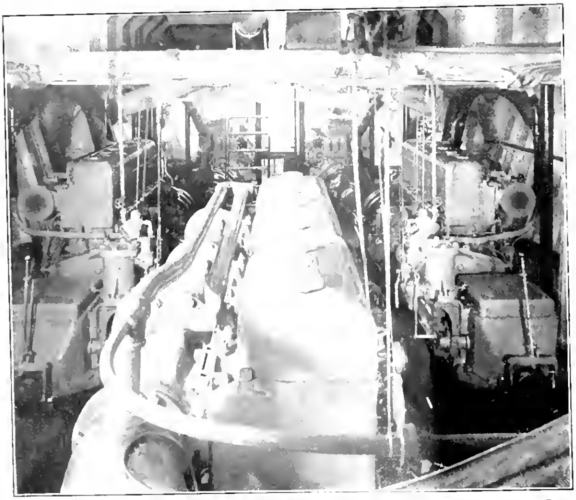
THE Coast Line Shipbuilding Company of Tacoma has recently delivered to the municipality of Tacoma, Washington, a steel fireboat which has a number of interesting and novel features.

The over-all length of the hull is 95 feet 6 inches with a molded beam of 21 feet and a fully loaded draft of 6 feet. The specifications required that in this hull there should be installed machinery of sufficient power to propel the hull at 16 statute miles an hour maximum; to pump water at 180 pounds gauge pressure for one hour at the rate of 20,000 gallons a minute, and at the same time propel the hull at 13 statute miles an hour. The only combination of machinery which will meet these requirements in a boat of this size at 6-foot draft is a combination of modern, high powered gasoline engines and modern centrifugal pumps.



The new Panther monitor nozzle in position for fighting fires under piers.

In Tacoma Fireboat No. 1, Sterling Viking type gasoline engines were chosen, and five 6-cylinder units were installed. These engines have cylinders with 8-inch bore and 9-inch stroke and each engine develops 425 brake horsepower at 1220 revolutions a minute. Two of these engines are used for pumping purposes only; two are arranged with double Sterling jaw clutches so that they can be used either for pumping or propulsion; one is used for propulsion only. This latter unit is located on the center line of the boat at the after end of the machinery space and is direct-connected to the central propeller shaft. As will be noted in the hold plan published herewith, the other four units are symmetrically arranged with two engines operating the outboard propeller shaft through clutches and with pumps installed at their forward ends arranged for clutch connection, the two forward engines being direct-connected to their pumps.



An interesting view of the machinery room showing the five 425-brake horsepower Sterling Viking Type gasoline engines and the four De Laval centrifugal pumps.

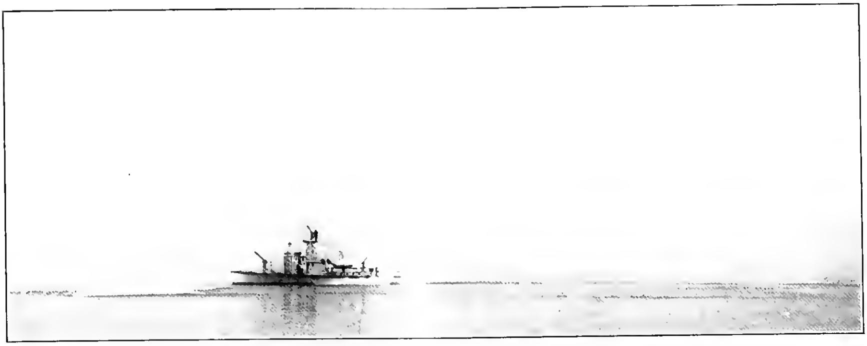
The main pumps are all of De Laval manufacture, 8-inch, 3-stage centrifugal. These pumps have a rated capacity of 2500 gallons per minute at 180 pounds per square inch when turning at 1200 revolutions a minute.

All of the engines, both pumping and propelling, are arranged for full pilot house control. Each engine is equipped with three Schebler carburetors with a quadruple Northeast Electric ignition system. There are two starting motors on each engine; and a 12-volt storage battery with 200 ampere capacity insures ample starting current. This storage battery is kept fully charged by a Rectigon auxiliary charger. Exhausts are all under water.

For lighting and small auxiliary motors, two 110-volt direct-current Kohler generating units are installed of 5 and 10 kilowatts capacity. An electric service and salvage pump of 100 gallons per minute capacity and a similar pump for the bilges take care of auxiliary pumping requirements.

The fire fighting equipment consists of five Morse monitors, one 4-inch mounted forward, one $2\frac{1}{2}$-inch on the tower, two $1\frac{1}{2}$-inch on the deck aft, and one $2\frac{1}{2}$-inch aft.

In addition to these a new type of monitor never before installed on a fireboat is being given its initial try-out on Tacoma Fireboat No. 1, and from the evidence pro-



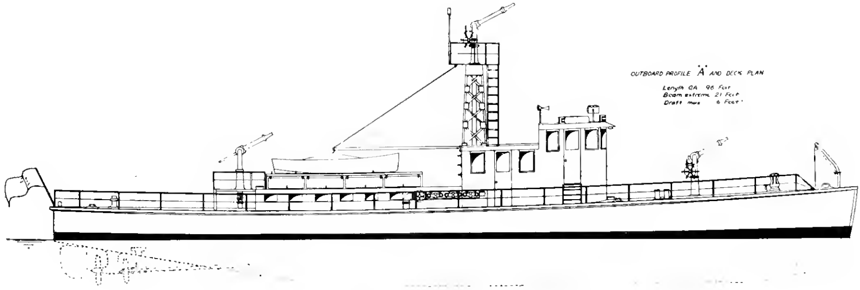
Tacoma Fireboat No. 1 with all seven nozzles in action.

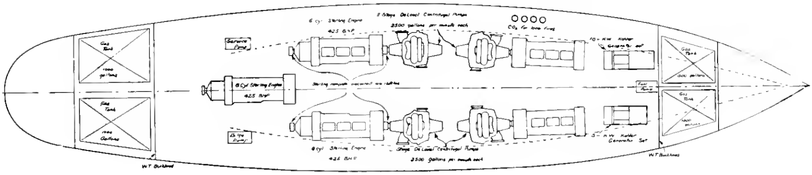
duced at the tests this new device promises to be very useful equipment, particularly in fighting fire under piers. It consists of two 1½-inch monitors built to the designs of Joseph Panther, Jr., fire inspector for the city of Tacoma. This new monitor is mounted on the deck close to the side in such fashion that it can be swung over the side and revolved to a position favorable for throwing a monitor stream in any direction underneath the pier or dock. The design of this monitor has been carefully worked out by Mr. Panther and is the result of years of experience in fighting and observing fires on the waterfront. It is fully covered by patents.

In her trial runs on Puget Sound, Tacoma Fireboat No. 1, with three propulsion engines, made an average of 16.6 statute miles an hour in four runs over the measured mile. With the center engine only in operation, she made an average of 13.45 miles an hour on two runs over the measured mile.

On the pumping tests with five monitors working, the pressure was kept at 183 pounds plus for one hour while delivering 10,000 gallons per minute, the average revolutions of the four engines during this hour being 1222 per minute. In the one-half hour overload run with the engines turning over at a net average speed of 1224 revolutions a minute, the pumps delivered 6888 gallons of water per minute at an average pressure of 201.4 pounds.

The Coast Line Shipbuilding Company, the Sterling Engine Company, and the De Laval Steam Turbine Company are all to be heartily congratulated on these very successful results.





MACHINERY ARRANGEMENT

The Economics of Safety

Effect of a Safety Program on Marine Terminal Economy

By Byron O. Pickard.

IT IS freely admitted by every marine operator that the cost due to injuries to workmen engaged in stevedoring work aboard ship and in other terminal operations is a considerable part of the total cost of marine terminal operations, especially when he signs a check in favor of the insurance company which assumes the risk of paying the bills for medical, hospital, and the legal compensation for lost wages due to injuries.

The scene pictured above shows a horrible exemple of poor shipkeeping which is all too frequent on the waterfront. Such a condition is a fertile breeding ground for lost-time and fatal accidents.

The compensation insurance premium is the only **direct** charge made for injuries in the terminal operation ledger, but, as will be pointed out later in this article, it is but a portion of the total charge which should be made to "accidents" costs. Frequently and inadvisedly, insurance premiums are carried as "overhead" charges, and are so considered. However, and especially for injury insurance, the charge should be made directly against an operation, and further, it should be distributed to the various operation units in proportion to each unit's injury frequency. When such distribution of costs is made, a real Prevention-of-Injuries campaign will have been started and the preliminary attack on the reduction of cost intelligently directed.

The manual or base rate for insurance protection on injury expense is determined by experienced engineers and actuaries who study the peculiar operations of an industry, determine upon the units according to the degree of hazard, and segregate the experience or injury costs accordingly. A flat rate then is not made for an industry, but, on the contrary, a special rate is made for each of the variable unit risks in the industry.

Insurance Protection Rates

Some of the California 1929 manual rates based on each $100.00 of payroll for terminal operations are as follows:

Marine surveyors	$1.59
Ship scaling and painting	7.85
Ship repair work	6.23
Port superintendents, port captains, port engineers, etc.	.53
Tallymen and checking clerks	1.59
Damaged container repairmen	1.69
Stevedores on dock under the hook	6.70
Stevedores handling trucks on dock	6.58
Stevedores aboard ship	11.11

It is apparent from the above that the cost is a variable with the hazard, and that the hazard is created directly by the operation "unit" and not by "overhead." In fact, "overhead" is always a questionable charge, and often covers the mistakes and kills the profits of industrial managements.

Lumping the manual rates for all the varied exposures in terminal operations, and assuming that the manual rate represents the average for the industry, it is safe to conclude that for every $1,000.00 spent in wages for operating terminal, more than $100.00 additional is given to the insurance carrier. That is, there is a 10% direct penalty added to the wage cost on account of injuries.

A study of injury causations is another major phase of a preliminary program to prevent injuries. Such a study requires a distinction between "accident" and "injury," for without the accident there would have been no injury. Actually, a study of injuries is made principally to determine what causes accidents, and it is the policy of a well developed safety organization to assign the cause of the accident as the cause of the injury, believing that practically all accidents are the results of mistakes, inefficiencies or lack of foresightedness, each of which are under the control of the management, and can be corrected through intelligent supervision and efficient methods.

Ten Accidents To One Injury

A study of 50,000 industrial injuries made by the Travelers Insurance Company, and reported in recent issues of "The Travelers Standard," their monthly publication, enabled the Company "to establish the conservative ratio of 10 to 1, between no injury (or potential injury) accidents and those causing injuries"; in more common-place language, it takes ten industrial accidents to result in one injury to a workman.

Can it not then be further reasonably concluded that it takes ten mistakes due to poor practices, poor supervision, and tolerated careless habits, to cause an injury? The acceptance of this conclusion would indicate that the study of injury causations is justifiable, if for no other reason than to indicate the time lost due to accidents, and to ascertain the causes, with the idea of developing and prescribing remedies.

In 1928, in the harbors of San Francisco Bay and Los Angeles, there were over 3,000 injuries to longshoremen which were sufficiently disabling to justify consideration as serious injuries. Fifteen hundred of these injuries occurred to the longshoremen handling cargo on the ship, 1300 to longshoremen handling cargo on the dock, and 200 to longshoremen receiving or discharging cargo directly from railroad cars. This number does not take into account any of the injuries to miscellaneous terminal employees, such as cargo loaders, sweepers, checkers, dock repairmen, ship repairmen, etc.

Causes of Accidents

A study of the major initial causes of the above-mentioned 3,000 accidents resulting in personal injuries to longshoremen developed that:

Twenty-four per cent of the injuries resulted from accidents causing longshoremen to strike against or get caught between objects being handled; 22% resulted from accidents causing objects to fall; 12% resulted from accidents causing persons to fall; 10% resulted from accidents in haulage operations; 8% resulted from strains and sprains from improper or over lifting. The remainder of the injuries were due to accidents caused by many miscellaneous causes.

A description of the detailed causes of the abovementioned major groups and a definite application of them as inefficient practices, would make an article of this nature too lengthy.

It would be interesting to make a further classification of each group on the following suggested efficiency basis:

(1) Accidents due to tolerated unsafe and inefficient practices;

(2) Accidents due to poor or lack of proper supervision;

(3) Accidents due to lack of coordinated efforts between dock and ship; between different docks; between different departments; between different gangs on the ships, and between different gangs on the docks.

(4) Accidents due to poor housekeeping on the docks, on ships, in gear rooms, etc.

(5) Accidents due to unsafe gear; not using proper gear, etc.

(6) Accidents due to physical conditions, such as poor light, poor ventilation, etc.

(7) Accidents due to tolerated unsafe and inefficient habits.

(8) Accidents due to fatigue; to the employment of men who are too old, physically unfit, inexperienced, or otherwise not adapted to terminal work.

The results of such a study would make it reasonable to conclude more positively that the aggregate cost in terminal operations due to accidental, that is, unforeseen, uncontrolled or uncorrected causes, is a considerable percentage of the total cost of operating a terminal.

Costs of Accidents

Compensation insurance actuaries have furnished further ammunition to the specialists in prevention of injuries through studies of the incidental costs of injuries, and have developed factors which indicate that in addition to the premium cost for the injured's lost time, medical and hospital treatment, there are costs to the employers on account of injuries due to:—

(a) Time lost by other employees who stop work out of curiosity, sympathy, assisting an injured person, loss of morale, etc.;

(b) Time lost by foremen and other supervising officials in assisting injured; selecting or training new employees; preparing accident reports, etc.;

(c) Cost due to first-aid attendant's treatment;

(d) Cost due to injury of gear, cargo, dock, ship, etc.;

(e) Capital cost due to nonproduction of gear and ship that are temporarily out of use;

(f) Cost due to probable comparative partial productivity of new employees substituted for the former capable employees who are injured.

The aggregate cost due to these and other incidental causes of injuries also negatively effect the economical operation of a terminal.

It has been mentioned casually herein and should be stressed, that accidents not only cause injuries to workers, but injuries to cargo handling gear, to the cargo itself, to docks and to ships, and result not only in wastage of human bodies and of human effort, but also in the wastage of costly material, such as cargo, expensive gear, expensive equipment and the like.

Pilferage of cargo is an economic loss which can also be indirectly attributed to accidents.

Delays are always the result of accidents.

Little has been mentioned in the foregoing relative to the economic loss due to fatalities, and permanent disabilities, and in a lesser degree the temporary disabilities of workmen. However, this indirectly is a very proper charge to be made against an industry; whether or not it is a proper charge to make against an individual operator may be debatable.

Those engaged in directing safety campaigns claim credit only when the compensation insurance premiums drop or the direct costs of injuries are decreased. Credit for efficient methods, coordinated effort, ideal working conditions, stoppage of wastage, harmonious labor conditions, dignifying the standing of the workmen,

Exterior and interior views of standard first-aid station installed by Norton, Lilly & Co. on their San Francisco pier. Norton, Lilly & Co. are equipping all of their Pacific Coast piers with this type of first-aid station.

elimination of pilferage, elimination of malingering, does and properly should go to the company's safety-minded supervisory operating staff. But it should always be remembered that safety-mindedness owes its inspiration and perpetuation to the prevention-of-injury movement.

It is a poorly directed safety program that adds to the employer's "overhead" or slows up production; there are but few instances on record that indicate that safety does not save money and pay dividends. It has been stated by the manager of a large stevedoring firm that his profits were what he saved by prevention of "accidents," and he meant "accidents," for he has learned that injuries represent only a portion of the cost due to industrial accidents.

Carelessness

To such of the terminal operators as still insist that most accidents are the result of "carelessness," it should be stated :

(1) That "carelessness" in a workman is nothing more or less than a habit of being "careless" which is tolerated by the boss, possibly practiced by the boss himself, by his superior, and on up the line to the manager;

(2) That being careless of one's person, is indicative of being careless with company property, cargo and other valuable materials;

(3) That careless habits are wasteful and inefficient, and reflect seriously on the management;

(4) The correction of careless habits is accomplished by precept and example; by safety minded intelligent supervision; by discipline; by consistently maintaining clean, orderly working places, and by having an operation so well organized, planned and supervised that an atmosphere charged with nervousness, chaos and confusion cannot exist.

Conclusion

An intelligently directed program, having in mind the elimination of such industrial injuries as are not caused by an "act of God," or uncontrollable human weaknesses and temperament, will reduce the cost of any terminal operation from 10% to 25%.

Waterfront Cold Storage

By J. R. West,
Port Engineer, Port of Seattle, Washington*

BOTH publicly and privately owned and operated cold storage plants naturally fall into one of the following three classes:

1. Those constructed to store the products of the sea, that, from the nature of their origin, arrive at the plant by boat and after storage may be shipped out by either boat or rail, or by truck for local consumption.

2. Those constructed to store the products of the land, that may arrive at or depart from the plant by boat.

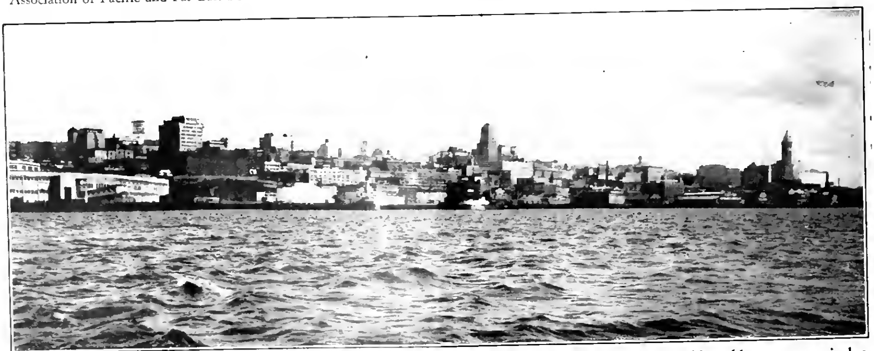
3. Those constructed to store the products of the land, that in general neither arrive nor depart by boat.

Obviously plants of the third class do not need to be located on the waterfront, and in fact in most cases should be at some distance away so as not to occupy space that should be devoted primarily to shipping. A location away from the waterfront will also often afford a position nearer the center of distribution and where access will be more convenient.

Fish Cold Storage

Plants of the first class, that is, those that provide storage for the products of the sea, have been built at many points along the Alaska, British Columbia and United States Pacific Coast. The primary purpose of such plants, when built by private capital, is to store the fish belonging to the owners of the plants, who may be engaged in fishing or who may be merely dealers, buying their fish from independent fishermen or at the local fish exchanges. Opportunity may or may not be offered by such plants for the storage of fish belonging to others than the plant owners, but even if storage is available for others, it would likely be on such terms and conditions as to make it unattractive. It is conceivable that, under particularly benevolent management, a fish cold storage plant that is owned and operated by those engaged in the business of buying and

*Abstract of paper read before the July, 1929, Convention of the Association of Pacific and Far East Ports.



A portion of the waterfront of the City of Seattle. The Queen City of Puget Sound has found her waterside cold storage terminal a profitable asset in developing port business.

selling fish would provide storage and the accessory facilities on equal terms to all engaged in the fish business. Necessarily, however, in actual practice such plants are not run as benevolent institutions but to make a profit for their owners and not to develop competing concerns. The major part of the fish caught along the Pacific Coast that is handled through cold storage plants is, however, taken care of in the privately owned and operated plants. The system has grown and developed to meet the special conditions existing and the fishing industry has grown and thrived.

There may arise, however, circumstances at individual ports that call for the ownership and operation of fish cold storage plants by the public. Where such plants are provided and properly operated, all dealers in fish are offered the facilities on substantially the same terms. Independent fishing boat owners can place their cargoes of fish in cold storage and hold them for satisfactory prices, if they are not willing to accept what is offered when the fish arrives. While probably only a few fishermen take advantage of their opportunities in this way, the mere possibility of their doing so, stabilizes the price paid for the fish. Largely the same results would be obtained in the case of a privately owned plant if operated as a public utility under proper control as to charges and services. The value of such a fish cold storage plant in the development of a port, whether publicly owned and operated or privately owned and operated as a public utility, is obvious. It encourages a fundamental industry, tends to add to the tonnage of the port and to increase the permanent working population.

It certainly requires no argument to demonstrate the necessity of the location of such a cold storage plant directly on or closely adjacent to the waterfront in order that the fish can be taken quickly and cheaply from the boats to the cold storage rooms. Such a plant also requires adequate and convenient rail and street connections to facilitate the shipping out of the frozen or iced fish, as most of it is ordinarily shipped out overland.

General Cold Storage at Waterside

Cold storage plants of the second class, located on the waterfront, are not as numerous as those built to handle primarily fish, but there has been an increasing tendency during the past few years for the construction of such plants. Refrigeration is being applied all the time to more products of the land for their proper preservation when kept in storage. And at the same time, more and more ships are being equipped for carrying perishable products at constant temperatures, usually lower than the atmospheric temperature. People all over the world are becoming educated to the use of fruits and vegetables that must be brought from other climatic regions. Thus Chinese are learning to enjoy Washington grown apples and citrus fruits from California.

In most prosperous agricultural regions producing fruits, vegetables, eggs, meats or other perishable products, for export, local cold storage plants are built. This makes it possible to hold the products at the point of production awaiting shipment either to the sea coast for dispatch by boat, choice often being offered between different ports, or to the interior by rail. This allows the greatest choice of markets. There are in many cases, however, advantages in storing perishable goods in a port terminal cold storage warehouse, while awaiting shipment, especially when the goods are held by brokers. The greatest use, though, for a cold storage plant as a part of a scheme of terminal facilities is to act in the nature of an equalizing reservoir, allowing the accumulation and holding under proper conditions, of shipments of perishable products pending the arrival of the ship.

In the case of a shipment of any material size, it is ordinarily impracticable to dispatch it from a cold storage plant located at the point of production at such a time and at such a rate as to meet the loading requirements of a particular ship, in which case, terminal cold storage space becomes a necessity. But under certain circumstances, this equalizing reservoir principle is not of great usefulness. For example: apples grown in Eastern Washington are largely held in storage in the producing region, cargoes for export being assembled in Seattle in the transit sheds before the arrival of the ship and during loading. During the past season a total of 3,701,709 boxes of apples were shipped over the Port of Seattle wharves, while of this number only about 50,000 boxes were put in cold storage at Seattle before shipment. This of course is possible on account of the comparatively short time required for shipment from the producing districts to Seattle and because the temperature of the air at Seattle during the exporting season is near enough to the proper storage temperature for apples, so that there is no damaging change in the temperature of the apples during storage in the transit sheds and during loading. But with perishable goods exported or imported at times when the air temperature is materially higher, or lower, than the storage temperatures for the goods, cold storage in the port is practically a necessity.

Where considerable quantities of perishable goods are exported or imported by water, there is the same necessity for cold storage space on the waterfront as there is for transit shed space. In fact, in the case of cold storage space, there is the added reason for shipside location that the transportation of perishables for considerable distances is likely to subject them to damaging changes in temperature. An uptown cold storage warehouse is therefore at a distinct disadvantage as compared with one on the waterfront when handling goods for export or receiving such as imports.

Cold storage plants in a port facilitate the importation and exportation of products that are shipped in refrigerated space on the boats and thereby increase the total amount and diversity of the shipments through the port. Location of such a plant on the waterfront decreases the cost of handling the goods and minimizes damage due to changes of temperature during transshipment.

Riding Lights on Lightships

THE general direction in which a lightship is heading gives an approaching vessel a good idea of the directional set of the current in the vicinity of the lightship. As most lightships now show but one masthead light, the United States Lighthouse Service has adopted a uniform system of displaying a fixed white light on the forestay of lightships to assist vessels in determining the direction in which the ship is heading. It is believed this will be of material assistance to navigators as well as to tenders making a lightship after nightfall.

The Lighthouse Service now maintains 37 lightships on the Atlantic, Gulf, and Pacific Coasts, 29 of which are equipped with such riding lights, and the work of installation on other ships will continue as occasion requires. Such riding lights, with some variations, have been in service for some years on certain lightships, but only recently has a uniform system been adopted.

Richmond's Port Development

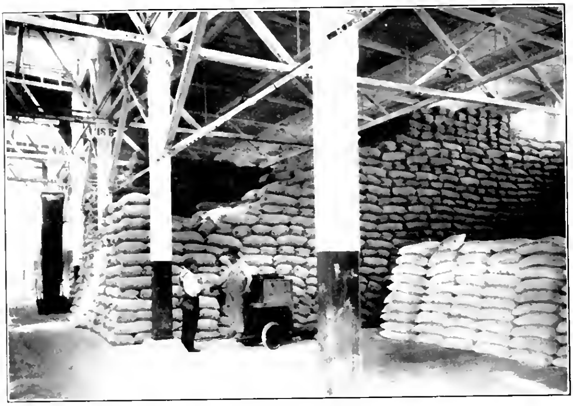
Great San Francisco Bay Oil Port Opens New Terminal to Accommodate Increase in General Cargo Business

BELIEVING that shipping is vital to the welfare of a community, the city of Richmond has just taken another forward step by completing the Parr-Richmond Terminal No. 3, situated on the inner harbor.

This new facility takes rank with the finest on the Pacific coast, and since its formal opening early last month has set forth in earnest to secure its share of the tonnage which flows in and out through the Golden Gate.

That this tonnage will be quickly secured is the opinion of Fred D. Parr, President of the Parr Terminal Company, lessee of lands on the inner harbor, and a partner with the municipality of Richmond in the construction and operation of the new terminal as well as the old terminal on the outer harbor.

Parr came into Richmond three years ago with a concrete plan for the development of inner harbor lands, then mostly submerged and wholly undeveloped. His plan involved leasing inner harbor acreage, taking over the outer harbor terminal and the old sugar wharf on the inner harbor, the construction of the new facility just finished, and the bringing to Richmond

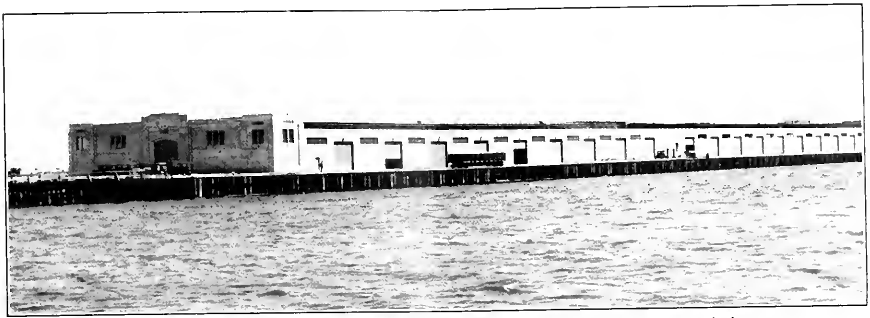


A NATURAL PORT

As shown from the air in the illustration below, Point Richmond's projection into the waters of San Francisco Bay forms a very beautiful and natural setting for the protection and accommodation of shipping. To bring this harbor closer to the city of Richmond, the inner harbor, shown at the back of the point, has been developed.

San Francisco Bay, itself, is completely land-locked. The harbor of Richmond is almost completely land-locked from even the gentle storms that might arise on a large body of inland water like San Francisco Bay. It has complete connection with transcontinental railway systems, ample level area for industrial sites, and already established some of the largest industrial plants in central California.

Above is shown an interior view of the new Parr-Richmond Terminal with considerable cargo awaiting shipment.



Exterior view of the new Parr-Richmond Terminal No. 3 recently opened on Richmond's inner harbor.

of new industries that would produce new wealth, greater payrolls, and tonnage for the shipping facilities.

Richmond accepted Parr and his plan, and rapid progress has been made since that time. Parr went to Detroit, presented the story of Richmond to the Ford Motor Company, and sold them 70 acres on the inner harbor adjoining the site of the new facility. The agreement provided for dredging the channel to 32 feet, filling the land, development of proper street, rail, water and sewer connections. Most of the provisions of the agreement have been carried out by the city and Richmond looks forward to some early action by the maker of all the flivvers toward building here his proposed $5,000,000 assembling plant.

Following the sale of the land to the Ford Motor Company, Parr and the city went forward with the plans for the new terminal. It was conceived on a huge scale, 900 feet long, with two covered compartments each 400 feet in length and separated by a concrete firewall. This arrangement makes it possible to store gasoline and other highly inflammable materials in one compartment while the other is filled with miscellaneous cargo, without increasing the insurance costs.

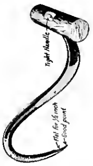
The new terminal is fitted with the most modern and scientific mechanism for handling and stacking cargo. The Southern Pacific and the Sante Fe are making joint use of the tracks on both the land and water sides of the new Richmond facility, giving the terminal two transcontinental rail connections, in addition to its water and highway connections.

Complete steamer connections are now being arranged for. The Nelson line, the first coastwise company, to make Richmond a regular port of call, is already delivering and receiving cargo there twice a week. Ships of the Pacific Westbound Conference have agreed to include Richmond in their schedules as soon as tonnage is developed to justify them in making calls there.

PACIFIC COAST FISHING FLEETS

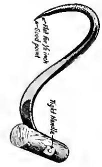
The business of rigging, equipping, and maintaining the sea fishing fleets of the Pacific Coast is one of the fastest growing industries of the West. The above illustration shows a part of the fishing fleet assembled for overhaul at the Fishing Vessel Owners' Marine Ways, Seattle, in the spring of 1929.

This plant is only one of many in the Puget Sound district devoted to fishing fleets. The Columbia River district, Grays Harbor, Coos Bay, Humboldt Bay, the San Francisco Bay district, the Bay of Monterey, the Los Angeles Harbor district, and the Port of San Diego all show like activity. The tendency, both in construction and in equipment, is strongly toward larger, faster, and a better-equipped craft for deepsea fishing; and the experience is that the business of deepsea fishing warrants the larger expenditures for better equipment.



Pacific Coast Marine Safety Code

Complete Text of a Remarkable Document Which Proves Pacific Coast World Leadership in Cooperative Effort to Provide Safety for Cargo Handling and Stevedoring Operations Aboard Ship



SECTION 1.

Scope

Rule 1. This Code applies to all cargo handling and stevedoring operations aboard ship and covers all operations, persons, employees, employers, and vessels included under the Federal Longshoremen's and Harbor Workers' Compensation Act in the States of the Pacific Coast.

Purpose and Exceptions

Rule 2. The purpose of this code is to provide reasonable minimum requirements for safety of life, limb, and health. In cases of practical difficulty or unnecessary hardship an employer may make exceptions from the literal requirements of this code, or permit the use of other devices or methods, but only when it is clearly evident that equivalent protection is provided. Any exceptions for an employer shall be referred first to his District Code Committee; if the proposed exception is approved by his committee, it shall be forwarded to the General Chairman of the Pacific Coast Safety Code Committee, who shall take a referendum vote by mail of the entire Code Committee. Special port or district rules can be adopted by the Code Committee by means of the same procedure provided for employer "exceptions" above.

Mandatory and Advisory Requirements

Rule 3. The word **Shall** is to be understood as mandatory and the word **Should** as advisory.

SECTION 2. RESPONSIBILITIES AND DUTIES UNDER THE CODE

Rule 201. The vessel, its owner, master, and officer in charge shall be severally and jointly responsible for the safe condition of the ship's gear and equipment, and for the competency of any ship's officer or member of the crew who may engage in operations covered by this code. They shall provide, so far as the same shall be under their control, a safe working place upon the vessel for all operations carried on upon it.

Rule 202. The stevedoring contractor is responsible for the proper and safe condition of all stevedoring gear supplied by it, and for the competency of foremen and other persons supplied by it in charge of operations.

Rule 203. The duties of the General Foreman are: To see that all gear is in apparent good safe working condition during the stevedoring operations. He is in charge of all stowage and handling of cargo. He should see that stevedoring operations are carried on in a safe manner. Where conditions warrant, and he is not in immediate touch with his superior officers, he should stop work if necessary to avoid accidents.

Rule 204. The duties of the Gang Foreman are: To be in direct charge of his gang, to supervise all the stevedoring operations in connection therewith and see that all work is done in a safe manner. He shall report promptly to the general foreman any defect in the gear or any unsafe working condition. In the event that the gang foreman or hatch tender, upon discovery of defective gear, should find it impossible to get in touch immediately with the general foreman, he shall himself stop work, if necessary, until the general foreman shall have had opportunity to pass upon the situation.

Rule 205. The duties of the Hatch Tender or Gangwayman are: He should be familiar with the deck stevedoring operations and be capable of rigging booms, derricks, and other deck gear for the proper hoisting or moving of cargo.

Before commencing to hoist cargo, he should, in conjunction with the gang foreman, see that the boom topping lifts and boom guys are properly secured and the saveall made fast; that the space from the hatch coamings to the ship's side is clear for working cargo and the hatch beams, strongbacks, fore and afters, and hatch covers stowed on deck in a safe, orderly manner; and inspect generally, as far as possible, all running gear for any defect or unsafe working condition.

He shall see that the cargo is properly slung before being hoisted, and shall control the movements of slingloads or drafts by positive signals to the winch driver. He should keep the slingload or draft in sight when being moved, and warn all persons in danger of being injured by the movement of cargo. Whenever operations are suspended or terminated, he shall see that the hatch covers are on, or safety lines are stretched around hatch coamings, and rope stretched across side rail opening or side rails properly shipped, if the appliances are supplied by the vessel, or unless the duty has been assumed by the vessel. He shall be held responsible, together with the gang foreman, for the safety of the men during the operations.

Rule 206. The duties of the Winchdriver are: To see before starting hoisting operations that the winch is free from water, that the cargo fall is in good order and properly secured to the winch drum, and that the winch is in good order, reporting any defects to the gang foreman. He shall take signals only from the hatch tender, if a hatch tender is used, for the operation of the winch, and shall at all times operate the winch or winches in a safe manner. If the winches are not properly oiled, he shall report same to his foreman. When leaving winch unattended, he shall see that the steam is turned off.

Rule 207. The duties of the Longshoremen, in addition to those presented elsewhere in this code, shall be to use the safety devices provided, to practice the safety methods prescribed, and to cooperate in all that makes for safety.

SECTION 3. GENERAL SAFETY RULES

Rule 301. All gears and friction drives, wherever located, should be completely encased. Where, in the case of gears, this is impracticable, a band guard should be provided with side flanges extending inward beyond the root of the teeth.

Rule 302. Where there is a spoke hazard, the spokes should always be covered on exposed side.

Rule 303. All sprocket wheels, wherever located, should be completely encased.

Rule 304. All projecting set screws on moving parts should be removed, or countersunk or headless set screw should be used. No part of the set screw should project above the surface.

Rule 305. Shaft keys, unless enclosed by the housing of the machine, should be flush or protected with cylindrical safety sleeves, or completely enclosed.

Rule 306. Shields or screens should be provided which will prevent contact with crank, connecting rod, valve rod, steam jam cylinder or other moving parts.

Rule 307. Removal of existing protective appliances during stevedoring operations is strictly prohibited.

Rule 308. If tools, materials, appliances, or any gear are at any time found to be out of repair, defective, or in any way unsafe, employees shall report the same to the person in charge of the work immediately.

Rule 309. Where an edge of cargo or of a landing platform is exposed and there is danger of falls of persons, the edge should be guarded by a life line.

Rule 310. Winches, conveyors, belts, and all driving gears may be lubricated while in motion only when this can be done by means of suitable contrivances, without danger.

Rule 311. Lubricating and oiling while a machine is in motion may be done only by persons authorized to do so.

Rule 312. Cleaning of machine parts may be done only while the machine is not in motion.

Rule 313. Chains shall not be repaired, even temporarily, by bolting two links together or by the use of wire.

Rule 314. Employees shall do everything possible to prevent fires. Smoking is prohibited.

Rule 315. Entering dark holds, decks, or compartments without a light is prohibited.

Rule 316. Naked lights are prohibited in stevedoring operations aboard ship.

Rule 317. Each company shall promulgate and enforce a rule that drunkenness will not be tolerated. No employee or employer or representative of employing stevedore or ship who has any contact with stevedore operations shall be allowed to go to work, or continue at work, if under influence of liquor.

SECTION 4. GENERAL WORKING CONDITIONS

Reporting of Injuries

Rule 401. Whenever an injury occurs, the foreman in charge shall see that the injured party is given prompt and immediate attention. It shall be the duty of the injured man, if physically able, to report any injury, however trivial, to the Foreman immediately.

First Aid

Rule 402. An approved first-aid kit shall always be immediately available when and where operations are being carried on. The first-aid kit shall be in charge of, and maintained fully stocked by, a designated attendant who shall be trained to render first aid to the injured. The first aid attendant should always be available to give immediate assistance. One or more stretchers shall be available at places where operations are being carried on, to be furnished by the vessel or by the dock operators.

Rule 403. At each major port there shall be provided by some appropriate port organization, facilities for the formation of a first aid corps, and for the training of persons employed who wish to qualify to render first aid.

Rule 404. Notices shall be exhibited in prominent positions at every dock, or wharf, stating:

(a) The position of the first aid kit, and the name of the person in charge thereof.

(b) The telephone number of emergency hospital or ambulance service.

(c) Name, address, and telephone number of company's physician and hospital.

Rule 405. One or more life buoys for the rescue of drowning persons shall be maintained at each dock.

Clean Drinking Water

Rule 406. At all places where operations are being carried on, good drinking water in covered clean utensils or devices shall be conveniently available.

Toilets

Rule 407. At least one conveniently accessible toilet, either on board the vessel or on the wharf or other place where the vessel is moored, shall be available at all times for the use of every person engaged in the operations. Such toilets shall be kept clean and in good order.

Decks, Floors and Passage Ways

Rule 408. All decks, floors, and other places, where persons are engaged in the operations, shall, as far as possible, be kept clean and free from dust, litter, and slipperiness.

Rule 409. Grease, oils, etc., spilled where stevedoring operations are being carried on shall be immediately sanded to protect footing until cleaned up.

Rule 410. General foremen shall not permit operations on or in ship's decks, holds, or other places unless adequately lighted.

Rule 411. One or more lights shall be kept burning on the dock near the gangplank or other entrance to the ship after dark while ship is tied up to dock.

Rule 412. Passageways on dock shall be kept clear from tackle end of ship's gear to shed, to give ample room for hooking or landing loads or drafts, except when working cars direct to or from ship.

Rule 413. Where men are to be required to work in a space below a deck where cargo is stowed, the said cargo in said deck shall be so stowed as to have clear space of three feet around hatch coaming of said deck for handling hatch covers.

Access to Vessels

Rule 414. When a ship is lying at a dock, there shall be provided at all times a safe means of going to and from the ship consisting of a gangplank or other equally adequate method. All persons going to and from the ship must use this equipment. "Short-cuts" over side via cargo slings, save-alls, moving conveyors, etc., are prohibited.

Rule 415. Where a gangplank is reasonably practicable, a gangplank not less than 22 inches wide shall be provided and properly secured to the ship. Such gangplank shall be provided with a two-rail railing on each side; such railing shall be not less than three and one-half ($3\frac{1}{2}$) feet high; the upper and lower rails to consist of wood, taut ropes or chains or other equally safe devices.

Rule 416. In other cases a ladder shall be provided which shall be of sound material, of adequate length, and properly secured to prevent slipping.

Rule 417. If a ship, boat, or other vessel is alongside any other ship, boat, or other vessel, and persons employed are required to pass from one to the other, a safe means of access shall be provided by the ship, boat or other vessel which has the higher freeboard.

Rule 418. When working barge, scow, raft, or log boom alongside ship, a Jacobs ladder, or its equivalent, properly secured, shall be provided and used for each separate unit of operation.

Hold Ladders

Rule 419. Ladders shall be provided in all holds where employees are engaged in stevedoring operations. Where it is impracticable to use a ladder, an equivalent safe means of escape shall be provided.

Rule 420. Ship's ladders providing entrance to and exit from holds shall be kept in repair and in safe condition.

Rule 421. Hold ladders shall he kept clear, and no cargo stowed within six inches from inside rungs of ladders. If cargo is so stowed that it is not possible to use permanent hold ladders, portable ladders shall be provided and properly secured.

Winch Operations

Rule 422. A place provided for winch drivers to stand or sit shall be kept in good order and all means taken to prevent slipping and falling of seat of driver.

Rule 423. The ship's gear should be so rigged as to protect the winch driver against swinging loads.

Rule 424. All winches operating with a single lever shall be counterbalanced by a weight properly secured.

Rule 425. Extensions on operating levers of winches, of substantial material, where necessary, shall be furnished by the ship, and securely attached to the regular lever.

Noxious Cargo

Rule 426. Longshoremen shall wear (a) approved goggles when handling cargo liable to injure or irritate the eyes; (b) respirators of an approved type when handling cargo liable to injure or irritate the respiratory passages and lungs.

Rule 427. When such goggles and respirators are required, same shall be provided by employer.

Rule 428. Strict care should be exercised when entering holds that have been recently fumigated.

SECTION 5. SAFE PRACTICES

(a) Preparation of Hatch and Decks for Cargo Handling Operations

Rule 501. No cargo shall be worked through a section of a hatch unless the strongback of section adjacent to uncovered portion of hatch is bolted to hatch coamings, or otherwise secured or removed.

Rule 502. No cargo shall be hoisted from hatch until hatch covers and strongbacks are off and stowed clear of working gear, except such cargo as must be removed to clear beams.

Rule 503. Strongbacks and hatch covers shall be so stowed as not to interfere with a safe walkway for hatch tenders from rail to hatch coaming, and so that drafts or gear cannot tip same into hatches or over ship's side.

Rule 504. Foremen or hatch tenders shall personally supervise the taking off or placing of hatch covers, strongbacks and beams.

Rule 505. When employees are below, they shall stand in the clear while strongbacks, hatch beams and hatch covers are being taken out or put in place.

Rule 506. Dunnage shall not be handled over the heads of longshoremen.

Rule 507. Where temporary deck stage is used for the purpose of loading or unloading ships, such stage shall be strongly built and securely fastened.

Rule 508. When it is necessary to work cargo on a skeleton deck, safe decking must be provided unless the workmen can work safely from the cargo stowed below such skeleton deck.

Rule 509. Employees shall never ride strongbacks or beams; nor shall they unnecessarily walk or climb upon them while in place.

Rule 510. When working cargo over a **deck load** a safe walkway shall be provided for the hatch tender from rail to coaming.

Rule 511. Deck loads shall be so stowed as not to interfere with safe operation of winches or to permit loose material falling into hatches or overside.

(b) Rigging of Ship's Gear for Cargo Handling Operations

Rule 512. Longshoremen should not be hoisted aloft except by hand power; booms should be lowered to deck for changing gear, or making necessary repairs.

Rule 513. The winch fall should be so wound that the lever shall have the same direction of operation as the load being handled. Winches hereafter constructed shall be made so that they can be operated as above recommended.

Rule 514. The boom guys and preventers should be kept as far away from the heel of the boom as possible, but not past the line of the fall. They shall be made fast so as to divide the strain on both. Preventers should be made fast around the head of the boom independent of all other fastenings.

Rule 515. Measures shall be taken to prevent steam from, or to, any crane, winch or other appliance obscuring any part of the decks, gangways, stages, wharf, or other place, or otherwise hindering or injuring any person employed in the operations.

(c) Handling of Cargo and Practices Incidental Thereto

Rule 516. Riding cargo hook is prohibited; however in emergencies, and under safe working conditions, specially prepared slings may be ridden in and out of the holds, under the order and direct supervision of the foreman.

Rule 517. Sling loads shall not be held suspended over men's heads, either on dock or ship; standing or working under hanging loads is prohibited.

Rule 518. No cargo shall be loaded or unloaded by a fall or sling at any intermediate deck unless either the hatch at that deck is safely covered, or a secure landing platform of a width not less than that of one section of hatch coverings, has been placed across the hatch.

Rule 519. Blocks, crow bars, chain slings, and other heavy equipment shall not be thrown from dock to ship's hold or from deck to dock.

Rule 520. While working cargo which may shift or roll on workmen, the cargo shall be secured or blocked.

Rule 521. All cargo raised by hoisting gear shall always be carefully secured against falling or spreading.

Rule 522. In hoisting lump coal or similar bulk cargo in baskets, tubs, etc., containers should not be filled above the rim.

Rule 523. When assisting to steady or land a load, longshoremen should not stand between the load and any fixed object, and shall **always face the load.** Loads shall not be lifted from cars or docks when men are standing between load and ship.

Rule 524. When using a bull line to move cargo, the longshoremen should stand out of the bight, and clear of the throw of the lead and hook.

Rule 525. A sling load or draft shall not be lifted with a chain having a kink in it. A chain shall not be shortened by wiring or tieing (See also Rule 313).

Rule 526. Each employer shall employ for every

hatch or set of winches being operated a signal man, gangwayman, or hatch tender. (See also hatch tenders' duties—Rule 205).

Rule 527. The riding of moving conveyors, other than of mechanical stevedores, escalators, or other devices especially designed for transportation of men, is strictly prohibited. Such special devices as are permissible for transporting men in and out of vessels, may be ridden only when the driver is at the controls and can stop the device.

Room 528. Two men shall be required on a log boom for each unit of operation. Life lines shall be furnished hanging overside to water's edge.

Rule 529. Men trimming bulk cargo are to be checked in and out of the hold.

Rule 530. Electric trimmers used for bulk cargo containing explosive dust shall be disconnected from conductors before being lowered into hold of ship; the electric current shall be kept shut off while conductors are being secured to or disconnected from the trimmers.

Rule 531. When men are working in the square of the hatch, bales of cotton, wool, cork, gunny bags, or other similar articles shall not be hoisted by hooks attached to the bands or fastenings of such bales.

(d) Preparation of Hatch and Deck At Suspension of Cargo Handling

Rule 532. When work in a hatch is finished for the day, upper deck hatch covers, or approved night hatches, shall be on, or safety lines stretched around the hatch coamings. (See Rule 205). Manholes and other deck openings should be protected in a safe manner. (Effective July 1, 1930).

SECTION 6. SHIP'S GEAR

Rule 601. All bridles for removing strongbacks or beams from hatch coamings shall be of sufficient length so that strongbacks can be hooked on without necessitating climbing out on them to do so; shackles or toggles are recommended in place of hooks for handling strongbacks.

Rule 602. All boom guys and gin blocks shall be secured by shackles.

Rule 603. When deck loads of lumber extend above the bulwarks, there should be a pennant of sufficient length to preclude sending a workman down ship's side to secure or release the boom guy from the deck ring bolt.

Rule 604. The ship shall furnish a sufficient number of approved topping lift stoppers where necessary for safely shifting derrick topping lifts.

Rule 605. Cargo booms should be tested and have approved capacity plainly marked in a conspicuous manner and place, preferably at the heel of the boom.

Rule 606. Cargo falls or ship's hoisting gear shall not be used to move railroad cars on docks.

Rule 607. Hatch rollers shall be so constructed that they can be firmly attached or secured to hatch coamings.

Rule 608. Broken, split, or ill fitting hatch covers shall at once be discarded or repaired. All hatch covers, and fore-and-aft and thwart-ship beams shall, insofar as they are not interchangeable, be kept plainly marked to indicate the deck and hatch to which they belong and their position therein, and a licensed ship's officer should be present and responsible for the proper covering and uncovering of all hatches.

Rule 609. Adequate hand grips shall be provided on all hatch covers, having regard to their size and weight.

Rule 610. Deflectors shall be used on openings from ships emitting waste water or matter interfering with the operations, or affecting the health of longshoremen.

Rule 611. Inspection of ship's cargo gear should be made by the ship's crew before gear is used for stevedoring operations. The crew should give all assistance possible to maintain properly ship's cargo gear while in use.

SECTION 7. STEVEDORING GEAR

Rule 701. Wire bridles shall have a covering of marline, rubber hose or other suitable protection for men's hands over hook-splice.

Rule 702. Savealls shall be stretched, hung and safely secured to vessel and dock, in line with each hatch when general cargo is being worked.

Rule 703. If tools, materials, appliances, or any gear are at any time found to be out of repair, defective, or in any way unsafe, men shall report the same immediately to the person in charge of the work.

Rule 704. Stevedoring gear shall be carefully inspected by a designated and competent employee before being issued for use in stevedoring any ship. Any unsafe or doubtful gear shall be discarded, marked, and so placed that it cannot be used by longshoremen.

International Lighthouse Conference

THE first International Lighthouse Conference that has ever been held met in London in July on the invitation of Trinity House, the English Lighthouse Authority. Trinity House is an organization with a long record of high achievement in the lighthouse work of the world. It holds a charter granted in 1514, and it has carried out some of the most important lighthouse engineering works, such as the building of the lighthouses on Eddystone Rock and Bishop Rock. It has included among its engineers Smeaton and Douglas, and on the governing board, known as the Elder Brethren of Trinity House, have been many of the noted men of England.

The conference included representatives of the lighthouse authorities of 24 countries and also of a number of local lighthouse organizations and interested industries. The conference was entirely informal and its purpose was the exchange of information and the discussion of problems affecting lighthouse systems; it did not undertake to pass final judgment on any matter.

The Conference was opened under the presidency of the Master of Trinity House, the Duke of Connaught, and the Chairman of its meetings was Admiral Mansell, the Deputy Master. Sessions were held from July 8 to July 12, and during the following week inspection trips were made to various works. The principal topics of discussion were lighthouse illuminants, unattended lighting systems, aerial lights, floating aids to navigation, including lightships and buoys, lighthouse structures, fog signals, radio beacons, and other related matters. Much interesting information was presented, both in formal papers submitted in advance and in discussion at the Conference. The proceedings will be published by Trinity House.

The representatives of the United States were: George R. Putnam, Commissioner of Lighthouses, Washington; J. T. Yates, superintendent of the Third Lighthouse District, New York; and H. W. Rhodes, superintendent of the Eighteenth Lighthouse District, San Francisco, all of the Department of Commerce.

Trade, Traffic, and Shipping

An Air Service in Hawaii

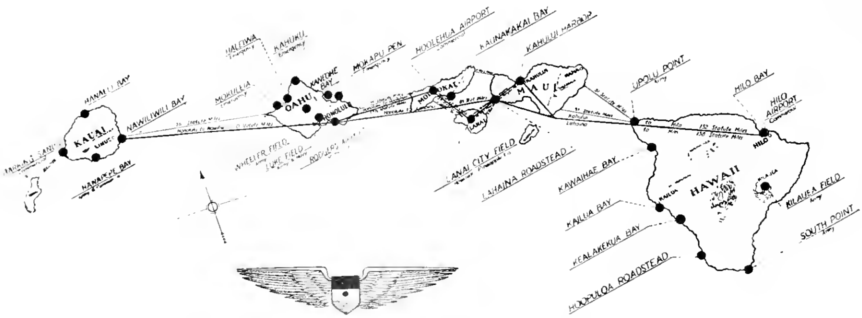
Inter-Island Steam Navigation Company Organizes Subsidiary; Second Line Also To Enter Field

By Andrew Farrell

CANOES, schooners, steamships, airplanes — those four words summarize the development in communication among the islands of the Hawaiian group. Prior to the coming of white men, travel between the islands, no doubt restricted enough at best, was by outrigger canoes, craft so slow and toilsome that they were used largely for war and little in errands of peace. With the political unification of the group by Kamehameha the Great, inter-island hostilities ceased; and the arrival of white men in larger and larger numbers soon placed sailing vessels at the disposal of the archipelago. As was indicated, these craft were principally schooners, which were more serviceable than were square-rigged vessels, inasmuch as one leg or the other of a round voyage was a beat to windward against the northeast trades. Steamers followed; and for seventy-five years or so they enjoyed a virtual monopoly of business. Now come airplanes, two companies, Inter-Island Airways, Limited, and Hawaiian Airways Company, Limited, having been organized to open aerial service between Honolulu and the outlying islands of the group in September and October of this year.

Of the two corporations, Inter-Island Airways is of primary interest to readers of Pacific Marine Review because it is a subsidiary of the long-established and well-known Inter-Island Steam Navigation Company of Honolulu, which in turn is closely associated with the Matson Navigation Company. No doubt there are elsewhere in the world affiliated steamship and airplane lines; it may be questioned, however, whether there are many, and the coordination in Hawaii should be of some little interest.

Notwithstanding the marked improvements made in its fleet by the Inter-Island within recent years, communication between the islands of Hawaii has remained relatively slow. A hundred-mile voyage from Honolulu to Ahutini on the island of Kauai, for example, has required ten hours—not because the new steamers, such as the excellent Waialeale were unable to make better time, but because of the conditions of business and navigation. Sailings are naturally in the evening, in order that no business day is lost; and the hours of departure and arrival are determined not so much by the speed of vessels as by the desirability of arriving and departing by daylight, or not too long before or after. Furthermore vessels must remain at island ports for at least a day, and frequently more; and the volume of business has not justified daily sailings to each island. In quite a few cases, indeed, the service of the Inter-Island has been materially in excess of requirements; and the company could have increased its earnings materially by dispatching fewer vessels and by filling them fuller of passengers and freight. On the other hand the commercial interests of Hawaii are, for a small archipelago, extensive and important; and faster and faster transportation of passengers, mails and freight has been insistently demanded. Consequently the two aviation companies will



Map of the Hawaiian Islands showing locations of airports and airroutes. Note the emblem of the Inter-Island Airways, formed by giving wings to the house flag of the Inter-Island Steam Navigation Company.

meet an immediate need; they should prosper, especially after they have had an opportunity to demonstrate their capabilities. Instead of losing two or three days on a trip to Honolulu, a plantation manager of Kauai, for example, may lose no more than a day; and an executive of a Honolulu pineapple company may go to his fields on Molokai or Lanai in the morning and return in the afternoon. That has been possible heretofore, but only on specially chartered planes, since there was no regular service.

In its announcement the Inter-Island Airways has promised the operation of two Sikorsky twin-motored "amphibian" planes on two routes, Honolulu-Molokai-Lanai-Maui-Hilo and Honolulu-Kauai, beginning November 17. Only a semi-weekly service to Kauai is contemplated at first, with departures from Honolulu on Tuesday and Saturday mornings — that is, on alternate days from steamer sailings—and return to Honolulu in the afternoons of the same days. Lying isolated to the west of Honolulu, Kauai does not offer the business that is to be found to the east, where four islands can be served by one route. Consequently the Honolulu-Molokai-Lanai-Maui-Hilo service will be much more frequent, with departures from Honolulu on Monday, Tuesday, Thursday and Friday mornings and return in the same afternoons.

Hours will become almost minutes. Instead of spending ten hours on a steamer, the passenger bound to Kauai will spend an hour and fifteen minutes on an airplane. Hilo will be three hours or less from Honolulu, instead of fourteen. One likes to speculate on what Kamehameha would have thought of that.

Should the Inter-Island Airways receive a mail contract, a daily service, with the purchase of additional planes, would be expected. The company's first overtures for a mail contract met with a refusal by the postoffice department. This action, although disappointing to the people of Hawaii, is not so arbitrary as it might appear. Since sailings from Honolulu are in the evening and airplane departures will be in the morning, it is obvious that the plane would find that little mail had accumulated since the night before, and mail that had gone by steamer in the preceding evening would be at its destination ere the plane took off from Honolulu. But there are not, on the other hand, daily steamship sailings; and consequently the planes would afford a greatly improved mail service outward from Honolulu, and a still more improved service inward, since in many instances replies to correspondence could be received in Honolulu the same day. At the present time a letter mailed in Honolulu on Saturday is taken by the steamship Waialeale Sunday night to Kauai, arriving Monday morning; and a reply cannot be received in Honolulu before Wednesday morning. In such circumstances it is to be anticipated that the people of Hawaii will demand and eventually will receive air mail. Small though the population is, the interests of the islands are relatively far more important than those of many mainland communities that have long had air mail service. Particularly are the Honolulu newspapers concerned. At the present time three issues of the Star-Bulletin and four of the Advertiser are received on Kauai Monday morning; and that, as is quite apparent, discourages circulation. Daily delivery of newspapers to the outlying islands would not only help the papers themselves, but it would also unify the sentiment of the islands, and would bind them together in a way they never have been bound.

Stanley C. Kennedy, general manager of Inter-Island Airways, Honolulu.

Arthur H. Armitage, secretary and treasurer of Inter-Island Airways.

Hawaiian Airways contemplates opening a service in September or early October with two tri-motor Fokker planes; and daily service to Kauai and to Hilo is promised immediately, with daily service to Maui as soon as possible. This corporation is affiliated with the Standard Airlines and the Aero Corporation of California, both of which are represented on the board of Hawaiian Airways by the following: Jack Frye, president of Aero Corporation and Standard Airlines; Paul E. Richter, vice president of both companies; Nathan Newby, attorney and director of both companies; William G. McAdoo, former secretary of the treasury and director of both companies.

It would seem that of the competing companies Inter-Island Airways has an immediate advantage. Its affiliation with the Inter-Island Steam Navigation Company is of great importance. The established shops of the Inter-Island are open for machine work; of more consequence are the branches and agencies of the Inter-Island throughout the whole archipelago, which easily can assume representation of the airways without additional expense, and can book passengers one way by plane and another by steamer—what the steamship company loses the airplane company gains; and any mail sent by airplane is merely a transfer from one Inter-Island pocket to another. Nevertheless, the Hawaiian Airways will make a spirited fight; and the outcome will be worth watching.

Stanley C. Kennedy, son of James A. Kennedy, late president of the Inter-Island Steam Navigation Company, is general manager of Inter-Island Airways. Besides being thoroughly familiar with island transportation, due to long service with the Inter-Island, he is also an avi-

(Continued on Page 29, Blue Form)

The Care of Perishable Cargoes, II

An Analysis of the Causes of Damage to California Perishables in Maritime Transit and Some Suggestions for Protection of These Cargoes

By David W. Dickie

IN the first installment of this paper we set forth the causes for spoilage of fresh fruit and vegetables in transit and analyzed the atmospheric conditions that tend to encourage these causes. In this installment we shall consider some of the practical applications of this analysis to the problems of the operator.

Cold Storage

Commodities that are high in carbohydrates and low in proteins practically always have to be carried in cold storage; and their sensitiveness to spoiling by fermentation is almost in direct proportion to this ratio. For example the ratio of carbohydrates to protein in bananas is 17.7 to 1; oranges 14.1 to 1; onions 6.4 to 1. Onions are just at the border line where it is often a question as to the necessity for putting them in cold storage. In fact they have been carried successfully in ventilated holds where the conditions have not violated the physical laws behind the picture.

Under carbohydrates we noted that one of the byproducts of the ripening of fruit in transit was carbon dioxide. This gas must be gotten rid of either at certain intervals found by experience, which commonly means every six hours, or by the continuous process in which fresh air is constantly being substituted for the vitiated air in the storage chamber. Hence the air content of the storage space must be changed at intervals if proper carriage is to be maintained.

Let us assume that the temperature within the storage space has been maintained at 40 degrees and it is necessary to get rid of the carbon dioxide. As before, the outside air is at 81 degrees Fahrenheit, 86.5 per cent humidity, and 76.3 degrees dew point. Should we permit this air to enter the storage space where the cargo and air are at 40 degrees, the dew point will fall to 36.3 degrees provided the humidity is maintained at 86.5 per cent. With the deposit of moisture on cargo and on cooling coils, the humidity will also drop. When the humidity gets down to 60 per cent, the dew point will have fallen to 27.74 degrees Fahrenheit; so that if moisture is to be prevented from depositing on the cargo the cooling pipes should be installed in a separate compartment at a temperature below 27.74 degrees. If these pipes are maintained at a temperature of 16 or 17 degrees Fahrenheit, moisture in the air will deposit on the pipes until the air is in proper condition for introduction to the cold storage rooms.

The air in the separate chamber should not be released into the cold storage chamber until it is at the proper temperature and of the correct humidity to suit the particular commodity under refrigeration; and the air when in such condition should be circulated by means of fans or other mechanical contrivance. Therefore it is up to the engineer in charge to keep constant check not only on temperature but also on humidity. Humidity is measured by the Sling psychrometer and full instructions for its use are given in the dew point and humidity tables of the United States Department of Agriculture, Weather Bureau No. 235, under the head of Psychrometric Tables by Charles F. Marvin, obtainable from the Government Printing Office, Washington, D.C.

Inert Gas Methods

About thirty years ago a method of keeping fruit without refrigeration in an inert gas was worked out; but apparently due to the cost of the gas nothing came of it. The gas used by the experimenter was nitrogen, which stopped the process of ripening of the fruit at the point where the immersion in the gas took place.

There is a question whether ripe fruits will retain their flavors in nitrogen gas. In the case of fruits that have to be picked green, like bananas and pears, the flavor is not developed until the fruit is ripe; so almost without question if the nitrogen gas method of preserving fruit does not have some deleterious effect such as permitting the fruit to soften it would be suitable for bananas and pears.

The specific gravity of nitrogen as compared with air is 0.96758. So, while there is a tendency for the nitrogen to rise to the top of the space occupied by the fruit, the law of diffusion causes the released nitrogen to mix with the surrounding air. This means that considerably more volume of pure nitrogen has to be released for a specified space to displace the air. The excess diluted gas must be permitted to escape.

At the suggestion of the writer to the laboratories of the United Fruit Company, experiments are now in progress to determine the feasibility of carrying bananas by this method.

In June 1923 Edward Milani of San Francisco took out a patent on a method of storing fresh food products against deterioration for a predetermined period of time. This consists of packing the said produce in a container, then consuming the oxygen of the air within the container by burning alcohol within the container to form therein an inert gas, then during the consuming of the oxygen applying and hermetically sealing a cover to said container. The composition of ethyl alcohol is C_2H_5OH and it burns without smoke or residue forming water (H_2O) and carbon dioxide (CO_2). The specific gravity of carbon dioxide is 1.52932 as compared with Air=1; so that in burning the alcohol the carbon dioxide has a tendency to fall to the bottom and drive off the air and the remaining nitrogen in the container. This, however, is again modified by the law of diffusion of gases. It is necessary to use deodorized alcohol in order not to spoil the flavor of the fruit.

Mr. Milani states that packing the fruit in carbon dioxide does not do away with the requirement of being put in cold storage. He exhibited some strawberries that had been packed eighteen days, and they looked very attractive indeed.

It would appear at first glance that the exhaust gases from the smoke stack and from the internal combustion engines of the ship could be purified and used; but the cost of purifying the gases is more

than the cost of the purified gas bought in the market. Also the plant necessary to purify the gases would take up too much space in the ship.

From the above chemical and physical picture we will analyze the process of decay of the various cargoes mentioned and the procedure necessary to carry them safely or what should be necessary to "insure proper care and custody of the cargo in question."

Bananas

In the first stages after fertilization, the changes in the young fruit resemble those in the leaf; a variety of acids, tannius, and sometimes starch then accumulate, and, ultimately, as the fruit becomes ripe, carbohydrates and fruit ethers or aromatic substances are formed and the bitter, acid, or astringent taste disappears together with the starch.

The banana may be considered a typical starchy fruit. During ripening there is an evolution of carbon dioxide and a considerable conversion of the starch into sugar. Thus Prinsen-Geirligs found during six days the amount of starch decreased from 31 to 9 per cent, the cane sugar rose from 0.8 to 13.6 per cent, and the invert sugar from 0.25 to 8.3 per cent. The presence of oxygen is necessary for ripening. In an atmosphere of nitrogen the starch remains intact.

A careful study of the enzymes present in extracts of bananas gathered at different stages of ripening has been made by Tallerice. The catalytic enzyme which decomposes hydrogen peroxide is very active in the green fruit but weakens as it ripens. Diastase is only active in the green fruit or at the beginning of ripening: it then disappears. Invertase is absent during the green stage; the amount rapidly increases during ripening; and then gradually disappears. A proteoclastic enzyme is evident during the ripening and likewise vanishes. Maltase is not present at any period.

During ripening the skin of the banana changes from green to yellow, deep brown, and finally black; the fruit is then fully ripe. This change is due to an oxydase acting on some aromatic substance liberated from glucoside. The black color is quickly produced when a yellow banana skin is disintegrated by mincing or when the entire skin is exposed to the vapor of some hermone. Under natural conditions the stimulus which leads to blackening is given from within the fruit by the liberation of the characteristic ester of the banana, which acts as a powerful hermone.

Banana Stowage

Turning now to the instructions issued by the shipper, we will hook up the chemical analysis with the instructions.

1. Bananas must be raised three inches above the deck with grating dunnage to permit free circulation of air under the fruit.

2. Compartments are to be precooled to 50 degrees Fahrenheit; and this temperature will be maintained 48 hours prior to loading. The vessel will endeavor to maintain a delivery air temperature of 56 degrees while loading.

3. Lowest delivery air temperature after hatches are closed should be 56 degrees, and for no reason whatever should it go under 56 degrees. It can be kept at 56 degrees until return air temperature shows 58 degrees and then raised while keeping the delivery air temperature at 58 degrees steadily with fans working at full capacity.

Some shippers demand 12 to 12½ degrees Centigrade (53.6 to 54.5 degrees Fahrenheit.)

4 Air must be changed at least four times in 24 hours (6-hour change) for a period of at least 15 minutes each time and the speed of fans regulated to keep delivery air temperature at 56 degrees while changing air.

Some shippers demand a constant air change throughout the voyage, and this process is undoubtedly the best.

5 Coils may be used for precooling but must not be used while the fruit is on board.

(Note: Bananas may be carried for five or six days in cool, properly ventilated spaces, but the above instructions are for long voyages, 16 to 20 days in cold storage.)

As bananas contain 48.9 per cent of water, care must be taken to prevent the contraction or expansion of the water therein; otherwise the fibrous structure of the fruit will be injured. Consequently the temperature and variations thereof are stressed all through the instructions.

The circulation of the air through the stowage serves two purposes—that of carrying off the heat generated by the fermentation that takes place in the ripening of the fruit during transit, and the equalizing of the temperature throughout the cargo space. Unless the air is circulated, the temperature will be maintained properly in parts of the cargo while in air locked parts there will be a local rise of temperature. This explains the emphasis laid on placing dunnage under and around the cargo.

The changing of the air at least four times in 24 hours or continuously is to get rid of the carbon dioxide gas that is one of the byproducts of the fermentation that takes place while the fruit is ripening in transit and to get rid also of the characteristic ester that eminates from the interior of the banana and causes the skin to blacken.

The prohibition against using the cooling coils within the holds insures against the introduction of excess moisture in the cargo space. The air is cooled by the outside coils before being introduced and the cooling of the air precipitates the moisture on the coils, leaving the air reasonably dry. The return air temperature acts as a guide to the humidity of the air in the hold.

All of the above instructions are in connection with the carrying of bananas in refrigerated holds and have been worked out carefully to avoid the losses that have occurred in the past.

As bananas are one of the fruits that can be handled by the nitrogen gas method, extensive experiments would be justifiable at the present time, as it is now possible to get nitrogen gas in steel bottles compressed to 2000 pounds per square inch of a free gas capacity of 204 cubic feet. The cost runs as low as $1.50 per 100 cubic feet, and even lower when the quantities used are large.

It would appear at first glance that if the holds were insulated the nitrogen gas could be used for two purposes, cooling and arresting the process of fermentation; and the refrigeration machinery could be omitted.

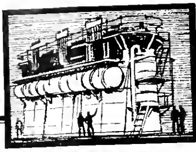
The Stuart Oxygen Company of San Francisco released a bottle of nitrogen into the atmosphere with the following results:

Temperature of the bottle and gas compressed to 2000 pounds pressure was 76 degrees Fahrenheit.

The temperature of the gas flowing from the valve on the bottle varied according to velocity of exit from plus 60 degrees down to minus 5 degrees Fahrenheit.

It would be necessary to have the crew equipped with oxygen masks when the holds were opened;

(Continued on Page 25, Blue Form)



In the Engine Room

A Novel Conversion Idea

More Speed and Less Fuel at Little Cost

FOR some years American operators, with and without government aid, have been running Shipping Board-built, 9- to 10-knot steamers in competition with 12- to 14-knot modern motorships. Naturally this kind of competition has directed their attention to the possibility of increasing the speed and efficiency of their steamers, and many proposals have been made to this end.

A recent suggestion made by the Washington Iron Works of Seattle to a Seattle naval architect initiates a novel method of increasing power and speed at low installation costs and with very good fuel economy.

The steamer in question is of the so-called 8800-ton class and is equipped with an ordinary triple expansion engine of the standard Shipping Board type and size for this class of vessel, developing about 2800 indicated horsepower. All auxiliaries are steam driven. With the existing plant in first-class condition the vessel is able to make approximately 10 knots at sea in good weather.

Her owners desired to transform her into a 13½-knot cargo liner with the least possible outlay of capital.

The Washington Iron Works suggested that, after fairing the lines slightly at the stern, the necessary additional power could be obtained by installing two 700 brake horsepower Washington-Estep diesel engines (one on either side of the present main engines) fitted to burn fuel oil and directly connected to electric generators; power from these generators to be applied to the main shaft through an electric motor; all the auxiliaries to be changed to electric drive; condensate to be used as cooling water for the diesels; and feed water to be heated by diesel exhaust.

They figure these machinery changes can be made at a cost of less than $200,000 and that the overall fuel economy on such plant would be less than 0.7 pound of fuel oil per shaft horsepower hour for all purposes.

This scheme has a number of very practicable advantages.

For conversion purposes it provides additional power at low cost.

For operating it provides two entirely independent means of propulsion in a single screw job. In the case of a shut-down of one or both diesels or of the electric plant, the steam plant takes charge. In the case of boiler or steam engine failure the diesel-electric plant picks up the job.

The cruising radius would be increased on account of better fuel economy.

Stand-by fuel consumption on boilers could be practically eliminated, as the diesel-electric plant would provide ample power for maneuvering and for harbor work.

In the case of the particular vessel involved in this suggestion, it is estimated that this conversion would enable her to make an additional round trip each year and that the fuel savings plus the increased earnings would very quickly amortise the cost.

This proposal is a very interesting one and is applicable to a very large fleet of steam vessels, particularly in our American merchant marine. Undoubtedly a standardized equipment for such conversions given an opportunity for installations covering many similar cargo boats could be manufactured and installed at figures very much lower than those which would have to be obtained for converting a single ship.

Shipowners can obtain from the revolving loan fund of the Shipping Board at low interest rates 75 per cent of the capital necessary for such improvements in their vessels, and it would certainly seem that there is food for much study and research in this suggestion.

British Liner Construction

By R. C. W. Courtney

ALTHOUGH a great many rumors are in circulation as to the intentions of the Cunard and White Star lines to build four mammoth record breakers for the transatlantic service, no definite announcement has as yet been made by either company. The White Star has, however, placed an order with its regular builders, Harland and Wolff, for a 60,000-ton liner to be called Oceanic; but this vessel has long been projected; in fact, P. A. S. Franklin, president of the International Mercantile Marine Company, stated before the control of the White Star Line passed out of American hands that the order was under consideration even then. Very little has been made public regarding the ship except that she is to be equipped with electric drive, and it was recently announced in the British daily press that all work had been suspended as the design was being altered with a view to increasing the speed owing to the initial success of the North German Lloyd new liner Bremen.

Whilst public attention has been fixed on the possibilities of these proposed liners, the fact that the Canadian Pacific Railway has a 40,000-ton flier on the stocks appears to have been overlooked. This fine ship has been given the name of Empress of Britain and is being built on the Clyde by John Brown & Co., Ltd., the builders of the Cunarders Lusitania, Aquitania, and the battle cruiser Hood. Construction is proceeding apace in order to

enable her to enter the Atlantic service at the opening of the St. Lawrence season in 1931; and she should be completed long before the Oceanic. Brief particulars have been announced, the length being 750 feet with a beam of 97 feet 6 inches, and although the speed has been given as 25 knots, there is no doubt that this figure will be considerably exceeded in service.

The power plant is to consist of high pressure turbines driving quadruple screws, and a considerable amount of special steel is being adopted for the topsides and deck structure. This Martinel steel, as it is called, is a heat-treated steel combining the workability of ordinary mild steel with a greatly increased elastic strength and has been used for a number of years by the Blue Funnel Line in the construction of all its new ships.

Another important Canadian-Pacific liner is the Empress of Japan, also under construction on the Clyde at the neighboring Fairfield yard, and destined for the transpacific service, calling at Honolulu en route. The tonnage in this case will be about 25,000 gross with 30,000 shaft horsepower on twin screws, and it is interesting to note that the bronze propellers which have recently been cast in London are so far the largest of their type to be made, the casting weight being 35 tons apiece.

There are very few other British liners at present on the stocks of over 15,000 tons gross with the exception of the 20,000 ton motor driven Winchester Castle now building at Belfast for the Southampton to South Africa service of the Union Castle Line.

There is little doubt, however, that several contracts of a very important nature will shortly be placed, and in order to provide suitable accommodation for the new liners when ready, the Southern Railway of England is pushing on with the construction of new deep water quays at Southampton as rapidly as possible.

What is the Non-stop Record?

IN a recent issue of Pacific Marine Review there was published an account of a record nonstop run for a diesel engine. It now appears that in publishing this account, we had overlooked some previous records and our attention has been directed to an even more remarkable nonstop run of 15 months, or 457 days, made by a 130-horsepower, 2-cylinder, De La Vergne diesel engine in the Municipal Electric Plant at Ashland, Kansas.

This run started at 2 P.M. October 24, 1924, and was completed at 2 P.M. January 24, 1926. A service engineer had thoroughly inspected all parts that could be inspected during the operation on January 5, 1926, and everything was found to be in running condition. But it was decided to end the run on January 24 and to remove and clean the pistons and rings as a matter of precaution.

On March 5, 1925, during this run, one fuel injection valve was removed and changed without stopping the engine. The fuel injection valve in the other cylinder was not changed during the entire run. The engine was off the line twice during the run, on December 26, 1925, for a change of the exciter belt, and on October 28, 1925, when it ran 30 minutes without load except for station lights and plant auxiliaries. On May 15, 1925, the oil ring on No. 1 crank stopped up with dirt and the crank pin box got hot. The operating men devised a way to clean the pin without stopping.

At the conclusion of this run the following parts were renewed: Two overflow regulating levers, one governor swivel, and two fuel pump cams. The pistons were removed and cleaned, the crank pin and wrist pin bearings tested, and the exhaust inlet and fuel pump valves ground.

We invite the attention of makers and users of diesel engines to these nonstop run records, and will be very glad to publish notice of any other unusual runs afloat or ashore.

Some Coal Records at Cristobal

THE steamship Chilore arrived at the coaling station at Cristobal from Norfolk, Virginia, on May 5, 1929, with a cargo of 20,069 tons of coal. This establishes a new record for cargo of coal received in one shipment at the plant, exceeding by 14 tons the cargo of 20,055 tons brought to the plant by the same vessel on June 21, 1926.

The shipment of 20,069 tons is believed to be the largest cargo of coal ever shipped. It is not, however, a record for the largest cargo of any kind ever handled through a port of the Canal. The tanker William Rockefeller, transiting the Canal on October 27, 1922, carried 22,000 tons of crude oil.

In handling the cargo from the Chilore arriving May 5, 1929, the coaling plant established a new record for rapid handling for this ship. The actual discharging time was 22 hours and 45 minutes, compared with the previous best record of 23 hours and 5 minutes for handling 20,038 tons arriving by the Chilore on February 29, 1928. The cargo of May 5, 1929, was discharged by 3 unloader towers; the tower-hours amounted to 66 hours and 25 minutes, and the rate of discharge averaged over 302 tons per tower per hour. The aggregate rate of discharge for the 22 hours and 45 minutes of actual discharging time was slightly over 882 tons per hour. This is the fastest rate of discharge yet attained for the Chilore, though this rate has been exceeded on other vessels of the Ore Steamship Line carrying smaller cargoes. The fastest rate of discharge yet attained for all vessels was in the discharge of the Bethore on January 8, 1929, when 8586 tons of coal were unloaded in 8 hours and 50 minutes by 3 unloader towers working 26½ tower-hours, an average of 324 tons per tower-hour. The rated capacity of these towers is 250 tons per hour.

—Panama Canal Record.

TRADE LITERATURE

The Sharples Super Centrifuge for Diesel Fuel and Lubricating Oil is the subject of a very attractive catalog recently published by **The Sharples Specialty Company** of Philadelphia.

Safe Oil Purification on Land or Sea is the slogan which brings this booklet to the fore. The catalog first of all sets forth the purpose of the Sharples Super Centrifuge and follows this up with a complete description of the methods of purifying fuel and lubricating oils for marine purposes. Fine coated stock is used for the book and it contains many photographs of power plants afloat and ashore which are kept in prime condition with the assistance of the Sharples super centrifuge.

Copies of the catalogue may be had on request to the head office or to its branches in all leading cities.

Workboats and Their Power Plants

Diesel-Electric Caterpillar Towboats

THE Standard Unit Navigation Company of St. Louis has installed a new system of river transportation on the Cumberland River in Tennessee. Electrically propelled towboats with a new caterpillar drive are used to move barge trains up and down the river hauling freight. The towboats were built by the Nashville Bridge Company of Nashville, Tennessee, and the electrical equipment designed and furnished by the Westinghouse Electric and Manufacturing Company.

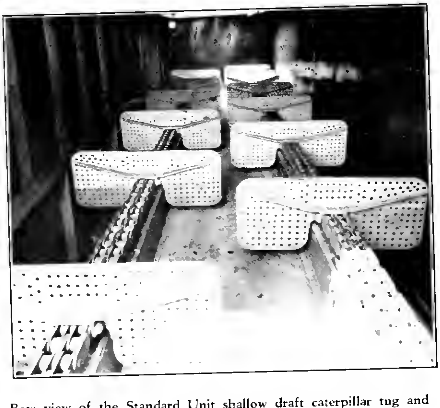
These small diesel-electric towboats, which draw only about 2 or 3 feet of water, act as switch engines and collect the barges from shipping points along the smaller streams. The "trains" or fleets of barges are then towed to distant points by larger towboats of similar or other design.

Two Standard Unit shallow draft barges and caterpillar tug.

As the barge fleet travels up or down a river, one of the smaller towboats detaches a barge from the fleet and takes it to a dock, where it may pick up another barge and attach it to the fleet. This can be done without stopping the barge fleet. Wireless telephones eventually will connect the towboats.

These towboats have diesel-electric drive. The diesel engines on the smaller boats have a fuel consumption at full load of about three gallons of oil per hour, which means a fuel bill of approximately only 18 cents an hour.

The caterpillar drive on each side of the towboats consists of a chain with blades attached in a manner resembling the method of attaching buckets on a chain conveyor. Separate motors operate the two caterpillar drives on each towboat. By reversing these drives, the towboats can be turned around in their own length. No rudder is necessary



Bow view of the Standard Unit shallow draft caterpillar tug and view in tunnel showing arrangement of treads on chains for the Sunco caterpillar system of canal towboat propulsion.

as the boat is controlled perfectly by the caterpillar drive. Because of their small draught, the smaller towboats can reach docks which have been unavailable to steamboats, with their deeper draught.

Each barge can be loaded through side doors, or through panels in the roof. They are coupled together in long lines, in single file or two or three abreast. A special form of coupler is used which resembles couplers of railway cars. Although the ends of the barges couple snugly together, the trains are quite flexible and are capable of making sharp bends because of a movable pontoon at one end of each barge.

Two sizes of barges are used. The larger ones have a capacity equivalent to three to five standard railroad freight cars, and the smaller ones a capacity equal to one to three freight cars according to draught obtainable.

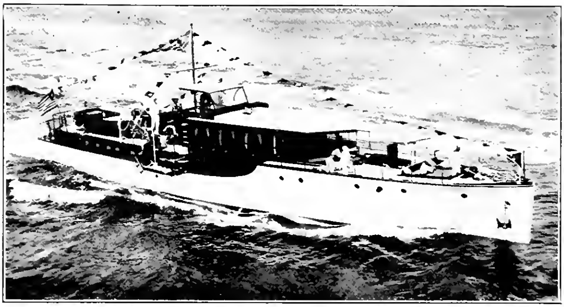
A Small Diesel Yacht

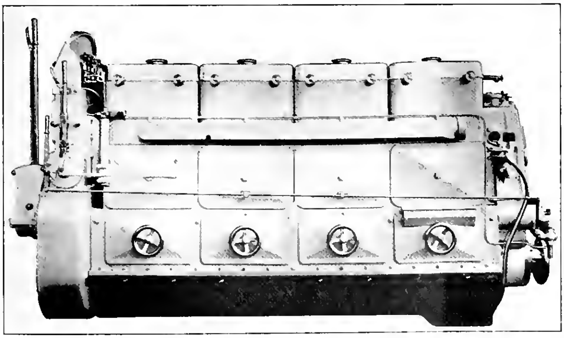
WE illustrate herewith the new yacht Saga built by Julius Peterson, Nyack, New York, to the designs of Cox & Stevens for Charles Payson of New York City.

This yacht is typical of a number of fast, small diesel yachts now building or recently completed on the Atlantic Coast. She has an overall length of 88 feet 9 inches, a beam of 15 feet, and a draft of 4 feet 9 inches. She is powered with two 8-cylinder Winton diesels of the new type which at full power drive her at a speed of 18 statute miles an hour. These engines and the yacht have already given a fine account of themselves in approximately 1500 miles of sea travel.

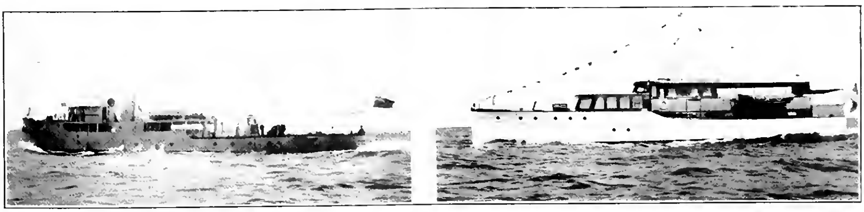
The accommodations provided are unusual in a boat of this size. The large living room in the deckhouse, as well as the staterooms, has an atmosphere of spaciousness and quiet restfulness not often found in boats of much larger dimensions. There are three double staterooms with bath, two toilets, and a shower. The hull is completely double planked with mahogany.

The Saga is equipped with a searchlight, radio direction finder, radio receiver, and signal gear. Her auxiliary power and lighting plant consists of a Winton Model W-2 6-cylinder gasoline engine, connected to a 10-kilowatt electric generator. She is equipped with electrical driven fresh water pumps and sanitary pumps and has a Kelvinator automatic refrigerator and cabinet. Her windlass, towing winch, and boat hoists are all electrically operated. Comfortable quarters for officers and crew are fitted forward.





Above view of Saga on trials running 18 miles an hour. Left, 8-cylinder Winton diesel of the new type, two of which are installed in the Saga. Below, two Winton-engined craft, a Canadian Coast Guard patrol boat for Great Lakes Service, and an American pleasure cruiser.



Automatic Refrigeration on Pleasure Boats

ICELESS refrigeration as pleasure boat equipment is beginning to reach the interesting phase of development where it is an integral construction factor, as illustrated in the case of the Martha Jane, the palatial $125,000 cruiser recently finished for George M. Cox, New Orleans manufacturer and sportsman.

The boat is one of the most luxurious on the lower Mississippi river. To make it an outstanding craft Commodore Cox and his architects studied and outlined with infinite care every detail that would help achieve that end. The refrigeration problem, vitally important on craft in the hot lower stretches of the Mississippi, received early attention and, because of the shallow draft of the boat, economy of space and lightness of equipment compelled extreme care. The result was that while the ship was still hardly more than a skeleton the refrigeration features were disposed of by the placing of a Copeland cabinet in the cook's galley and making provision for the condensing unit behind the port engine. The cabinet is of the type recently installed in 35 United States submarines. In the case of the Martha Jane the bottom of the box was sawed off to permit fitting between decks but without reducing storage or freezing space. The condensing unit is a Copeland Model H. twin-cylinder, operated by a 110-volt direct current lighting plant with Willard battery equipment.

The Martha Jane is 60 feet long, of 14 feet beam, powered by two 200-horsepower Sterling motors and capable of a 20-mile speed. It has accommodations for 14 passengers and carries a crew of four. All hoisting, cooling, heating, cooking, pumping, and refrigeration power is electric.

M. S. Aleutian Native Leaves on Maiden Voyage

ONE of the most interesting little ships to leave for Alaskan waters in recent years is the new M.S. Aleutian Native, owned and operated by the Kanaga Ranching Company of Seattle.

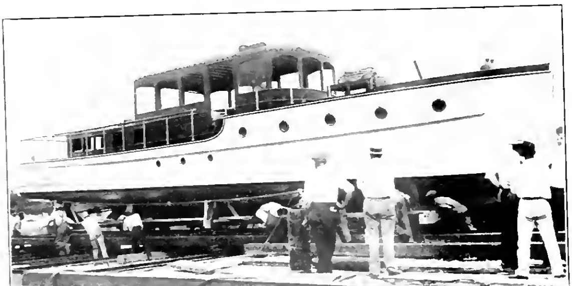
Perhaps the most interesting phase of this ship is the fact that before she became the present passenger and freight ship, she was for 16 years the old fireboat Chief, operating in the Willamette River, Portland, Oregon. Of exceptionally heavy construction, mainly due to the fact that she was fitted out with heavy steam pumping equipment, she has overall length of 132 ft., beam of 25 and draft of 9 ft. Rebuilding, accomplished at a cost of about $130,000, was done by the Lake Union Shipyards in Seattle.

Her power consists of twin six cylinder 200 hp. Washington-Estep diesels, having a bore of 10 inches and a stroke of 12½ inches. A two cylinder 44 hp. auxiliary Washington-Estep diesel driving a 25 kw. Westinghouse generator, supplies current to the deck machinery; ship's lighting and a 28 cell National Lead storage battery set. A 5-k.w. Westinghouse generator driven by the starboard engine provides lighting when the main auxiliary set is not needed. A Moran fire and bilge pump and a Duro sanitary and fresh water pump in addition to a Rix auxiliary gasoline driven air compressor make up the rest of the engine room auxiliary equipment. All four pumps are driven by Westinghouse D.C. 125 volt motors.

Two Cunningham cargo winches driven by 10 hp. Westinghouse motors through Cutler-Hammer controllers are located forward, and one driven by a 5 hp. motor aft. A fifteen hp. Westinghouse motor drives the Cunningham windlass forward. Cunningham steering gear is installed, with Corey engineroom signals and navigating equipment by Max Kuner of Seattle. An Arcola boiler, coal fired, supplies, steam heat, to the entire ship. Coolidge propellers are used.

The general layout of the ship is typically that of a trading schooner, as she will carry supplies and passengers to the company's posts in the far Western Aleutians, 1400 miles west of Ketchikan, along with her two sister ships, the Iskum and Kanaga Native. Quarters for four sailors are in the forecastle, followed by a large cargo space. Large master's quarters, equipped with toilet and bath are just aft of the pilot house with connecting stairway between. Five staterooms, with hot and cold water, spring berths, connecting toilets and steam heat are located on deck.

The entire ship, including the deck house is made of steel. Native quarters for 20 are located under the aft deck. Two heavy masts, equipped to carry auxiliary sails, the forward with two cargo booms and the aft with one, give her a yachty appearance. Considerable attention was attracted when she loaded for her trip North, and she has been classed as the finest equipped ship to ever sail to the Western Aleutians. Captain Harold E. Bowman, president of the Kanaga Ranching Company is taking the ship North on her maiden trip together with his wife and a party of 22 including Mr. Chas. F. A. Mann, official Pacific Marine Review correspondent, and his bride.



The Martha Jane, 60-foot pleasure cruiser of George M. Cox, New Orleans. This $125,000 craft is driven by twin screws and Sterling gasoline engines developing a speed of 20 miles an hour.

Auxiliaries—Ship Supplies—Marine Equipment

Repowering Dredges at Todd's Clinton Plant

DREDGE reconditioning and repowering are among the major ship operations that are specialized in at the Clinton plant of the Todd Shipyards Corporation. Some of the big dredges that have been in the plant during recent months include the Mohawk, New York, Lake Ellendale, and the Miami.

One of the largest dredges recently overhauled at the Clinton Plant was the Miami. After being sunk and wrecked in a hurricane off the Florida coast, the Miami was towed to the Clinton plant. There the hull was repaired and an entire new power plant installed. This included three water-tube boilers, with 3000 square feet of heating surface each, a turbo-generator set, a motor driven dredging pump with 30-inch suction, complete auxiliary machinery, cutter gear, winding machinery, and the machinery for raising and lowering the heavy steel spuds.

The Miami's first job after being reconditioned was on the filling in of the Barren Island Airport where she pumped some 4,000,000 cubic yards of material from the Rockaway Channel into the airport area, at the same time creating a ship channel through the inlet. It was on this job that she made a record of handling 57,000 cubic yards of solids in one 20-hour running period. Incidentally, she delivered material 9250 feet away from the dredge, an unusual feat. From Barren Island the Miami moved over to Seacaucus, New Jersey, to fill in for the huge airport on the Hackensack meadows.

The Mohawk was reboilered and completely rebuilt at the Clinton yard, after which she was operated under the direction of the State Parkway Commission on the filling in for the Jones Point Boulevard, connecting Fire Island with the mainland of Long Island. Here she worked and filled an average of 1000 cubic yards every running hour. She was then shifted to the Barren Island airport for short filling in behind bulkheads and dikes. Later she moved over to Seacaucus for similar work.

The dredge Lake Ellendale at the Clinton Plant of the Todd Shipyards Corporation.

Another large dredge, the Lake Ellendale, was recently completely reconditioned and rebuilt at the Clinton plant. The job included complete overhauling of the main engines, installation of new pumps of large capacity, removal of two Scotch boilers, reconstruction of fireroom space, and installation of four water-tube boilers, operating at 225 pounds working pressure, alteration of superstructure, repiping throughout, and installation of Todd oil burning equipment on the four new boilers. The old cutter drive arrangement was removed and a 600 horsepower turbine drive installed. This drive is a completely independent power plant having its own condenser, circulating water and air pump. It drives the cutter shaft through reduction gears at a speed of 32 revolutions per minute.

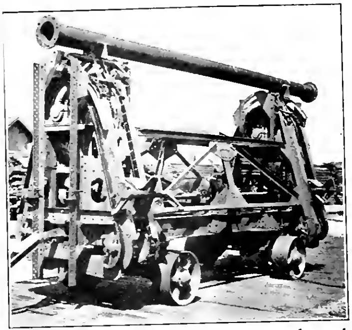
To enable the dredge to excavate to a depth of 62 feet below water the ladder was extended to a length of 75 feet. A complete new set of cutter shafting thrusts mounted directly on the ladder was installed. An entire new system of blocks and rigging had to be provided for handling the ladder. which weighs about 100 tons. The capacity of the dredge was increased from a 20-inch diameter to a 30-inch diameter suction and the necessary hull and discharge piping were installed to take care of the increased capacity.

The dredge was dry-docked for reconditioning of the bottom which had been damaged at various times in shallow water operations. On completion the Lake Ellendale moved up the Hudson to do 4,500,000 cubic yards of dredging and filling in the Ship Canal Terminal project after which she was scheduled to go to Cartagena, Colombia, on port development work.

The diesel dredge New York, one of the most modern and powerful dredges afloat, was recently overhauled and reconditioned at the Clinton plant before proceeding to work on the Albany ship canal project.

Parke & Kibele, Engineers

THE firm of Parke & Kibele, San Pedro, are very busy on voyage repairs to the steamers and motorships of Pacific Ocean fleets. Careful attention to detail and prompt meeting of contract obligations have made this Los Angeles Harbor firm popular with many operators.


The Goodall pipe racking machine as manufactured by Parke & Kibele.

In addition to ship and engine repairs, Parke and Kibele carry on a general engineering and machinery business, one of their specialities being equipment for handling large quantities of pipe.

The Goodall pipe racking machine and the Goodall pipe truck, as designed and built by Parke & Kibele, are revolutionizing the handling of pipe shipments on the San Pedro waterfront. This pipe racking machine as illustrated consists of pipe hooks or saddles arranged on endless chains that work over a suitable frame. These chains are driven by a 10-horsepower motor and as the pipe is fed off car, truck, or pile against the side of the machine the saddles pick up a length of pipe and deliver it over the top of the machine on to the rack.

In a recent test, 5 tons of pipe were racked in 1 minute and 15 seconds with this machine, or about one-sixth the time required by the dock crane for the same job. The crane required more labor as well as more time, and the operation by crane places workmen in hazard. The racking machine is automatic and reliable in its operations and eliminates all danger of accident to workmen.

Christie Marine Motor

THE Christie marine engine, in the improved type now being produced by the Christie Machine Works of San Francisco, is a modern gasoline motor producing 25 actual brake horsepower with a smoothness of operation and an economy of fuel that make it an ideal power plant for light workboats and small speed boats. This power plant consists of a 4-cylinder, 4-cycle, $3\frac{3}{4}$-inch bore, 4-inch stroke, gasoline engine delivering 25 brake horsepower at 1900 revolutions a minute and with its crankcase incorporating an especially designed reverse gear.

A circulating pump with cast bronze shell, special bronze pumping gears, and a rustless steel shaft drives a stream of water through the cooling chambers of the cylinders, cylinder heads, exhaust manifold and crank case.This water cooling of the crank case is an important feature in all marine power plants and especially in those that are totally enclosed in small underdeck compartments in the hulls of speed boats, as it means that the lubricating oil is always at the proper working temperature and provides a positive guard against fire hazard.

Lubrication in the Christie motor is a combination of the circulating and the splash systems, is entirely automatic, and requires no adjustment. Oil is drawn from the reservoir sump in the crank case pan by a specially designed gear pump which delivers oil to the dipper troughs under each connecting rod.

The reverse gear is of the planatary type and is so designed that in the neutral position the propeller is held absolutely stationary. Shifting from full speed ahead to full speed astern may be performed in one motion without pausing in neutral.

The assembly of the Christie marine engine makes a very neat, compact unit.

The Delco distributor, which is regular equipment, is mounted on top of the fly wheel casing in a very accessible location. A Zenith carburetor, together with the hot spot in the water-jacketed intake manifold, insures proper distribution of a perfectly vaporized fuel.

The starting motor and generator unit is the well known, dependable Northeast type.

The Christie Machine Works have had considerable experiencein solving the power problems of boat owners. The engineering organization is available for consultation and advice.

The Christie Machine Works are building a generating set using their marine engine as a prime mover. This set is self-contained and may be made either semi-automatic or fully automatic. It makes an ideal emergency lighting set for passenger vessels.

This marine motor is a thoroughgoing engineering job, and in its every detail it is designed for safe, reliable, economical operation under the conditions obtaining in motorboat operation.


Two American tankers and an American freighter docked at Park & Kibele's San Pedro outfitting piers for general voyage repairs.

Selective Fire Detection

WALTER KIDDE & COMPANY, Inc., of New York, has recently announced an improved system of fire detection which gives even better protection than its well proved and reliable Derby system. This new system is known as Selex, the name being derived from the selectivity of the system.

Like the Derby system, Selex warns of fire at the first lick of the flame; but, unlike the Derby system, Selex gives a direct indication of the number of the room in which the fire is burning.

With this system installed the watch officer goes straight to the affected room and usually is able to easily extinguish the fire without betraying its existence to passengers other than those occupying the room affected. Thus the Selex system saves the ship and her operators from ill repute and unfavorable publicity.

The Selex cabinet has a fire gong, which warns the watch officer immediately on the outbreak of the fire. On opening the door of this cabinet, the gong is stopped and an indicator panel is exposed, from which the officer can locate directly the cabin or space in which the fire has occurred.

The Selex thermostat is in two parts, a mounting box of Bakelite to which the wiring is connected and a thermostat of Monel metal. After the mounting box is installed and permanently wired, the thermostat simply plugs into it. The thermostat itself is automatically supervised so that it cannot be tampered with or removed without sounding the trouble bell in the wheel house.

Selex system conforms with all requirements of the United States Steamboat Inspection Service for fire protection in passenger quarters and fulfills all governmental regulations in this respect for other countries.

Hough & Egbert of San Francisco are Pacific Coast distributors for the Selex system and other products of Walter Kidde & Company, Inc.

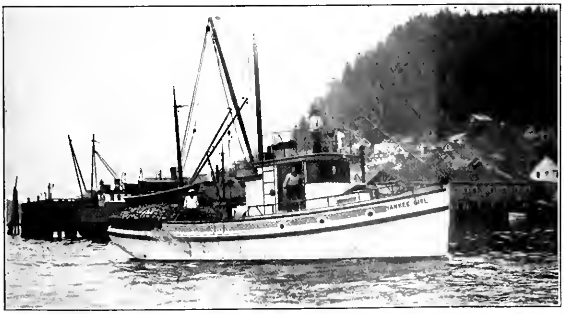
Westinghouse Develops New Metal

DEVELOPMENT of a new metal known as Konel, which is credited with being much stronger than other metals at high temperatures and which can be used extensively in the moving parts of internal combustion engines and other extremely hot places, has been announced by officials of the Westinghouse Electric and Manufacturing Company. The announcement followed the granting of foreign patent rights.

Originally developed by the Westinghouse Research Laboratories as a substitute for platinum in the manufacture of filaments for radio tubes, the new metal was discovered to be harder to forge than steel and to be very tough at high temperatures, when most metals lose their strength. Engineers predict many uses for Konel.

The new metal was created by Dr. E. F. Lowry, a graduate of Ohio State University. As a substitute of platinum, Westinghouse officials are authority for the statement that Konel already is saving approximately $250,000 monthly in the manufacture of radio tubes.

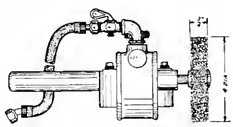
Platinum costs approximately $180 per ounce, while the new substance costs only a few dollars a pound. Life of Konel filaments is approximately ten times longer than other filaments. Tubes with filaments made of the new metal are operated 175 degrees colder than tubes with platinum filaments but with the same emission, thereby giving better reception results, research engineers say.



The trawler Yankee Girl of Puget Sound and Alaska. This trim fishing boat is powered with a 40-horsepower Fabco-Tuxham low compression oil engine operating at 475 revolutions a minute. This engine drives a 30- by 38-inch Coolidge propeller, giving the Yankee Girl 9 knots speed. She has been operating on the Alaska fishing grounds all summer very successfully.

Paasche Air Brush

THE light and simple pneumatic unit illustrated herewith is a very useful tool for removing rust, scale, or loose paint from any surface. It will accomplish this task more rapidly, more effectively, and with less effort than any other method of cleaning. It should therefore prove an ideal unit in connection with portable pneumatic pressure painting equipments on drydocks and on shipboard.



The Paasche air brush.

The net weight is ten pounds and the over-all dimensions are 11 inches length and 4½ inches diameter.

The Paasche air brush requires 8 to 16 cubic feet of free air per minute according to speed requirements. Six-inch diameter brushes with 1-inch face are optional equipment, the regular brush being 4 inches diameter and 3/4 inch face.

This brush is manufactured by the Paasche Air Brush Company, Chicago.

Organization Notes and Trade Literature

New Manager, Worthington's Buffalo Works

E. J. Schwanhausser, for the past two years assistant manager of the Harrison works of the **Worthington Pump and Machinery Corporation**, has been appointed manager of that company's Buffalo works. Only 35 years of age, Mr. Schwanhausser is one of the youngest executives in the Worthington organization whose employ he entered while yet a student at Stevens Institute of Technology. During the summers of 1912, 1913, and 1914 he was employed in the various shops and on the testing floors at Harrison.

Immediately upon his graduation in 1915, Mr. Schwanhausser was made test and erection engineer. In 1917, he was transferred to the condenser engineering department and in 1919 he was made machine shop equipment engineer. In 1920, Mr. Schwanhausser was promoted to the superintendency of the machine shops and in 1923 was appointed superintendent of the field erection department. He became engineering assistant to the manager in 1926, was made assistant to the manager in 1927, and, a few months later, was appointed assistant works manager.

Trade Literature

Report On the Protection Against Accidents of Workers Engaged In Loading and Unloading Ships

(181 pages; published by the International Labor Office, Geneva, Switzerland)

In order to effect a higher international standard of safety measures for the protection of waterfront employees, the International Labor Office has recently drawn up a Draft Convention of general, comprehensive provisions, which is based on the experience of 27 different governments. As stated in the explanatory report which includes the convention, "If its provisions are not as advanced and comprehensive as the national regulations in some countries, they are a considerable advance on the present situation in others, and may not unreasonably be regarded from the international standpoint as a comparatively high minimum standard of protection."

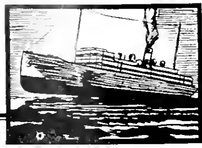
While no official data were received from the American Government on the subject to be included in the Report it is pointed out at the International Labor Office that some comparison between American regulations and the Draft may be made through examination of sets of safety rules which prevail on the Pacific Coast, as reprinted in the December, 1928, and February, 1929, issues of the Pacific Marine Review. Copies of the Report itself may be obtained in the United States from the World Peace Foundation, 40 Mt. Vernon Street, Boston.

The American rules, it is pointed out, while more detailed in nature, are founded for the most part on principles identical with those of the Draft Convention. One large exception to this statement is to be noted, however. Geneva officials explain that provisions for the safety of workers engaged in shore work are not as readily defined by international agreement as those aboard ship; as a result, only two of the thirteen articles of the Draft Convention are concerned with this problem, which governments believe they can meet more effectively through exclusively national legislation. By contrast, Americans appear to devote fully as much attention to safety conditions on shore as aboard ship, and consequently the scope of the Pacific Coast regulations is much greater in this respect than that of the proposed international agreement.

While the actual scope of American national and state legislation on the subject is not known, it is assumed by international officials that it goes considerably beyond the principles enumerated in the Draft Convention, which are felt to represent the minimum international standard. Furthermore, judging from available material, it is felt that the force of unofficial rules, which have no strict legal status but which have been adopted by common agreement between employers and employees, is greater in the United States than in many other countries, largely because of the faster spread of "Safety First" propaganda.

The Edna May moored in Grays Harbor. This vessel was built by a young man of Aberdeen, Washington, to be a cruising home for himself and bride. She is equipped with a small auxiliary engine and is outfitted for long ocean cruises. If reported schedules have been followed, she should now be returning from a long summer cruise in Alaskan waters.

Leaflet L-20377 has been issued by the **Westinghouse Electric and Manufacturing Company** on geared-turbine generator units. The leaflet brings out several new features on the compact unit, such as, requiring no bedplate because cylinder and gear housing are supported from generator frame, short over-all length of the set, rigidity obtained by means of only four bearings, and the unit requiring only piping and electrical connections before being ready for operation. The geared-turbine generator units may be obtained in either 30 or 50 kw. capacity.



Marine Insurance

Edited by JAMES A. QUINBY

Loan Receipts

Why the Marine Underwriter Pays a Loss and then Requires a Receipt Which Reduces his Payment to a Mere Loan, When, in the Ordinary Course, an Underwriter Could be Expected to Pay His Honest Losses Outright, Merely Requiring the Form of Receipt to Prevent Some Enthusiastic Assured from Collecting Twice

OF late years it has become necessary to take numerous types of subrogation receipts, assignments, and finally loan receipts in order that the underwriter's right of action against the carrier or other party might be preserved. We think a short discussion ofthe nature and necessity of the loan receipt is not amiss at this time in order that those who deal either directly or indirectly with marine insurance may understand the somewhat equivocal character of the document.

DARKNESS

The mate was on the stand, a man
With nervous hands, and eyes that squinted over-much
From peering into fog No trick of speech
Nor gift of eloquence was his, and yet the crowded room
Hung on his droning words, sucked in its breath, and saw
The death-throes of a stricken ship at midnight.
"She heeled to starboard when we struck—" he stopped
And labored with his words—"the light
From off the tanker played along her rail. Our boa's?
There was no time . . . . The light turned from us
And we were in darkness as she sank."

The court adjourned Men talked in little groups. I heard
The syndicate reporter tell his friend, ". . . no kick
To stuff like this . tomorrow I go South
To cover that Pantages case."

J. A. Q.

It must be remembered that almost every loss under a marine insurance policy is also accompanied by liability under another contract, i.e., the ocean bill of lading. In the early days of steam shipping in the United States, the shipowner refrained from any attempt to gain the benefit of the cargo owner's insurance, and the cargo insurer was under no necessity for subterfuge to preserve his right of subrogation. As trade and commerce prospered and legal ingenuity became a factor in ocean carriage, the bill of lading gradually took on its present cumbersome form. The natural purpose of the bill of lading is to preserve to the shipowner every possible benefit and to relieve him of every possible liability. It was already decided that without some specific contractual reference, the shipowner had no right to the benefit of the cargo owner's insurance. An additional clause was thereupon inserted in bills of lading reading in general as follows:

"In case of any loss, detriment, or damage done to or sustained by said goods or any part thereof, for which the carrier shall be liable to the shipper, owner, or consignee, the carrier shall, to the extent of such liability, have the full benefit of any insurance that may have been effected upon or on account of such goods."

As pointed out in Luckenbach vs. McCahan Sugar Ref. Co., 248 U.S. 139, at p. 146,

"Such a clause is valid because the carrier might himself have insured against the loss, even though occasioned by his own negligence; and if a shipper under a bill of lading containing this provision effects insurance and is paid the full amount of his loss, neither he nor the insurer can recover against the carrier."

Cases prior to the Luckenbach case consistently held that a shipper receiving an outright payment for his loss could not proceed against the carrier having the above clause in his bill of lading. It followed, of course, that the cargo insurer, who was subject to the same rights and disabilities as the shipper, was also barred from recovery against the carrier.

Policy vs. Bill of Lading

In order to meet this somewhat inequitable situation, the marine insurer immediately set about securing further ammunition in the form of clauses or agreements for his own protection. The first of these was the so-called "bailee clause" reading as follows:

"Warranted by the assured free from any liability for merchandise in the possession of any carrier or other bailee, who may be liable for any loss or damage thereto; and for merchandise shipped under a bill of lading containing a stipulation that the carrier may have the benefit of any insurance thereon."

The situation which resulted was, in short, that a carrier subject to the Harter Act would in no event be liable for damages occasioned by unseaworthiness, unless guilty of negligence, while the insurer would in no event be liable to the shipper, if the carrier was liable. It is plain to be seen that the deadlock thus created left the carrier and the cargo insurer free to pass the buck interminably, but was rather hard upon the cargo owner. In order that the cargo owner should not be deprived of the use of money which he was entitled to receive immediately after his loss, and, fur-

ther, that the insurer should not lose his right of subrogation, agreements or receipts were devised which professed to cloak any payment by the cargo insurer to his assured under the guise of a mere loan repayable in the event that the vessel was later found to be liable for the loss. This device, now in common use, is known as the loan receipt. Under its provisions the cargo insurer in effect says to his assured, "Under the bailee clause in my policy I am not liable for this loss if the shipowner is liable therefor. Pending the determination of the shipowner's liability, I am lending you the amount of the loss which is repayable to me without interest up to the extent of any recovery you may make from the shipowner or other bailee."

Like all legal devices, this document is practical in its results but somewhat absurd upon its face. The complicated clauses in the bill of lading and the policy, however, render its use justifiable and reasonable. In the Luckenbach vs. McCahan case referred to above, which is the leading case on the subject, the Supreme Court of the United States held that the loan receipt was effective in preserving to the insurer the right of subrogation against the carrier. The form of loan receipt used in that case was as follows:

"Received from the Federal Insurance Company, Twenty-three hundred four and 16/100 dollars, as a loan and repayable only to the extent of any net recovery we may make from any carrier, bailee, or others on account of loss to our property (described below) due to damage on S.S. Julia Luckenbach from Porto Rico/Philadelphia, on or about ...., 190 ....., or from any insurance effected by any carrier, bailee, or others on said property and as security for such repayment we hereby pledge to the said Federal Insurance Company the said recovery and deliver to them duly indorsed the bills of lading for said property, and we agree to enter and prosecute suit against said railroad, carrier, bailee, or others on said claim with all due diligence at the expense and under the exclusive direction and control of the said Federal Insurance Company.

Rhw W. J. McCahan Sugar Refining Co.,
R. S. Pomeroy, Treasurer.

$2,304.16.

Description of property: Sugar."

The principle thus established is still good law in our federal courts, as shown by the following extract from the very recent case of Y.B. No. 1, Libby, McNeill & Libby v. Young Bros., decided in the United States District Court for the District and Territory of Hawaii, May 15, 1929, cited in 1929 A.M.C. 948:

"With regard to the statement (in paragraph 'Fourth' of the answer) that all losses of the libellant have been paid by an insurance company, the evidence shows such payment was made under a loan receipt under an arrangement similar to that discussed in Luckenbach v. McCahan Sugar Co., 248 U.S. 139, and under this authority the libellant's claim is in nowise affected by this insurance payment."

It is thus apparent that the employment of loan receipts in substantially the form approved in the Luckenbach vs. McCahan case is essential under American law where the cargo underwriter wishes to protect his right of subrogation against the carrier or other bailee who may be shown liable for damage to the cargo insured. It is particularly necessary that the necessity for the use of loan receipts be thoroughly understood by foreign agents of insurance companies whose losses may be litigated against bailees by right of subrogation in American courts. A foreign agent located in, say, Shanghai, is not ordinarily conversant with the inter-relation of loan receipts, bailee clauses, benefit of insurance clauses, and the Harter Act. The law of the place where he is located may not give him or his principals the right of recovery against a carrier even should the above receipts be properly executed. In all cases of voyages to which the Harter Act applies (i.e., voyages from or to the United States of America) litigation against carriers may be commenced in the United States, where the employment of a loan receipt, as pointed out above, is absolutely necessary for the cargo insurer's protection.

Mary Foster-Mauna Kea Case Reversed

THE marine fraternity will remember that the District Court in Hawaii, following the collision between the lumber schooner Mary Foster and the steamer Mauna Kea in Honolulu harbor on April 20, 1923, held that the Mauna Kea was to blame for the collision, but limited the Mary Foster's recovery to her bare collision damage. The Mary Foster had stranded with a total loss of vessel and cargo shortly after the collision; but the district court refused to allow the total loss on the ground that the Mary Foster's negligent navigation was responsible for her stranding.

On August 12, 1929, the Circuit Court of Appeals for the Ninth Circuit reversed the district court and held the Mauna Kea responsible for the total loss, saying, "We do not think that the owners of the Mary Foster ought to be compelled to suffer a loss which would

not have occurred but for the admitted initial fault of the appellee."

The situation is parallel in many respects to that resulting from the famous collision which resulted in the loss of the tanker Lyman Stewart in the Golden Gate in 1922. In that case, the district court also limited the Lyman Stewart's recovery to the damages which existed immediately after the collision and held that the subsequent loss of the Lyman Stewart, when she went ashore near Mile Rock, was due to her failure to obtain assistance and to her improper navigation. The Circuit Court of Appeals in that case also reversed the District Court and found that the entire loss was a result of the collision.

Shipowner Authorized to Recover for Benefit of Cargo

THE status of a shipowner who sues in a collision case as bailee for cargo is not affected by the fact that cargo has paid a contribution in general average, according to the decision in Pool Shipping Co., Ltd. vs. United States, 33 F (2d) 275.

The case arose upon appeal by the United States, owner of the Coast Guard cutter Apache, from a decision awarding collision damages to the Pool Shipping Company as owner of the Clearpool and as bailee of her cargo. The appellant contended that the libelant's damages should be reduced by the contribution in general average made by the cargo to the hull.

After holding the shipowner entitled to sue as bailee for cargo, the Appellate Court proceeds as follows to hold that a general average contribution does not reduce the right of recovery.

"A contribution in general average by the owner of cargo, like the payment of insurance by an underwriter, results in his subrogation pro tanto to the claim of the shipowner against the wrongdoer. In other words, though the cargo paid the hull its contribution, the claim of the hull to recover general average expenses as part of its own collision damages would not be extinguished but, by equitable principles, would be kept alive and enforced for the benefit of the cargo.

"While there seems to be no precise authority applicable to the present case, the insurance decisions show the correct principle involved. It has long been settled that payment of insurance affords no defense to the wrongdoer in an action for collision damages. The Propeller Monticello vs. Mollison, 17 How. 152, 17 L. Ed. 68; The Potomac, 105 U. S. 630, 26 L. Ed. 1194. The cause of action survives and the insurer is subrogated. The obligation of the cargo to contribute to the sacrifice made in the common interest amounted to an involuntary insurance for the benefit of the hull. The Apache was primarily liable and the indemnifying cargo to the extent of its contributive obligation was secondarily liable. The latter was, therefore, in the position of a surety and entitled to subrogation. Any contention that this claim on behalf of the cargo is not within the terms of the special act is met by the construction of the act which we have already indicated.

"If, on the other hand, the cargo has not paid its general average contribution, the libelant may recover this amount as part of the collision damages. Gray's Harbor Tugboat Co. vs. Petersen (C.C.A.) 250 F. 956; Erie & Western Transportation Co. vs. City of Chicago (C.C.A.) 178 F. 42; The Energia (D.C.) 61 F. 224, aff'd in (C.C.A.) 66 F. 608. It therefore is quite immaterial whether the general average contribution in question has been paid by the cargo or not. In either event the cause of action to recover it as part of the collision damages would remain intact, and the satisfaction of the decree for this item would give the respondent a good discharge. The recovery to the extent of any amount therefore contributed by cargo would be for its account."

Mixed Cargo

Marine disasters on the Pacific Coast seem to come in cycles. San Francisco underwriters are still engaged in rueful contemplation of the Golden Forest episode, which entailed a cargo loss of approximately a quarter of a million, to say nothing of the hull and salvors' losses. And then, of course, we have with us the San Juan-Dodd collision of August 29, and the Virginia-Hermion affair of September 14.

We understand that the San Juan was not insured. Her cargo losses, however, will approximate $75,000.

George Ismon says that he knows there were plenty of life savers on the San Juan because he insured twenty cases himself. They were candy life savers, however.

On the same day late in September there appeared two very interesting items in the press.

One stated that the United States Navy had no vessel available to serve as a California State Nautical School Ship. The other announced that a first-class American sailing vessel had been purchased by Swedish interests, for cash, for a nautical school ship.

Long live the Vikings!

Ordinarily the uninsured portion of cargo in such disasters is small. In the Golden Forest case, however, we understand that there was considerable quantity of case oil that went to sea alone and unprotected by the covering mantle of a maritime policy, and the San Juan carried a $13,000 shipment of a San Francisco concern, which shipment was also uninsured. The secretary of the latter concern admitted that their coastwise shipments had been uninsured as a matter of policy for some time.

"We have been carrying our own insurance and have laid by the unpaid premiums to build up a fund to cover losses."

When asked how much that fund now amounted to, he admitted that it had just about reached $13,000.

Freights, Charters, Sales

September 19, 1929.

THE following steamers have been reported fixed with grain to the United Kingdom: British str. Benledi, North Pacific to U.K./-Continent, September, Canadian American Shipping Co.; Japanese str. . . . . Maru, Vancouver, B.C., to U.K./Continent, grain, 27/6, Oct./-Nov.; British m.s. Northmoor, Portland to U.K./Continent, Oct., Kerr, Gifford and Co.

The following steamers have been reported fixed with lumber to Australia: A Japanese steamer, two ports North Pacific to two ports Australia, $12.25, Sept., American Trading Co.; Japanese str. Koshin Maru, Columbia River to Australia, Sept., Pacific Export Lumber Co.; Japanese str. Taijen Maru, San Francisco, Eureka and Columbia River to Melbourne and Geelong, Sept., J. J. Moore and Co.; a Japanese str., Coos Bay and Columbia River to Australia, $11.50, Oct., Pacific Export Lumber Co.

The following steamers have been reported fixed with lumber to the Orient: British str. City of Vancouver, Coos Bay and Columbia River to Shanghai, $7, to Pukow $8, Sept., Dant & Russell; Japanese str. Buyo Maru, Columbia River to Japan, Sept., M. Nakata; Japanese str. Yoko Maru, Coos Bay and Columbia River to Shanghai, Sept., Dant & Russell; Japanese str. Gyokoh Maru, Columbia River to two ports Japan, Sept., Nagata and Co.; Japanese str. Koyu Maru, Coos Bay and Columbia River to Shanghai, Sept./Oct., Dant & Russell.

The following steamers have been reported fixed with lumber to the West Coast: American m.s. Frank Lynch, North Pacific to Guaymas, Chas. Nelson Co.; British str. Baron Ardrosson, Columbia River to Callao, Sept., J. J. Moore and Co.

The following steamers have been reported fixed with lumber to the Atlantic: British str. Forthbridge, British Columbia to U. S. North of Hatteras, Sept., Canadian American Shipping Co.; American str. Lake Benbow, Puget Sound and Portland to New York, Sept., Blanchard Lumber Co.

The British str. Cape Cornwall has been fixed from British Columbia to U.K./Continent, Sept., by Canadian American Shipping Co.

The following time charters are reported: Norwegian m.s. Hoyanger, 1 trip, delivery Vancouver, B. C., redelivery U.K./Continent, prompt, W. L. Comyn and Co.; Norwegian m.s. Soloy, Pacific Trade two years, delivery Colon, 1.57½, Dec./Jan., American Trading Co.

The following sales have been reported: American steamer Sutransco, to be renamed Admiral Chase, from Transmarine Line to Pacific Steamship Co.; American ships David Dollar and Lasbek from Robert Dollar Company to Alameda Airport.

PAGE BROTHERS, Brokers.

Shipping Notes

Tanner Bros., San Pedro, Calif., who are engaged in the business of provisioning vessels, has announced that a new $125,000 plant will be built at Seventh & Mesa Streets, San Pedro. The plant will have cold storage facilities for three carloads of fresh meat, with additional storage rooms for all staple and fresh provisions. Frank L. Stiff of San Pedro is the architect.

Norton, Lilly & Co. at Portland, Oregon, has established a stevedoring force to handle all cargo on vessels of the Argonaut and Isthmian lines. T. C. Green is the manager of the department, which will be known as the Seaboard Stevedoring Corporation.

Nelson Steamship Company of San Francisco, James Tyson, president, has entered the transatlantic cargo business under the name of Southgate-Nelson Corporation, and headquarters will be maintained at Southgate Pier, Norfolk, Virginia. The new organization has been allocated four Shipping Board steamers formerly in the outport service of the American Merchant Lines. They are the City of Flint, Quaker City, Leigh, and Capulin, and are of 7725 tons deadweight, of the "Hog Island A" class. They will operate out of the ports of Baltimore, Norfolk, Philadelphia, Boston, and Portland, Maine, to London and Hull and to London, Leith and Dundee.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

SOME LATE SHIPBUILDING CONTRACTS

A Large Lake Freighter

Three new orders are listed by the Great Lakes Engineering Co., River Rouge, Mich. One 80-foot and one 60-foot steel scows, hull Nos. 272 and 273, for builders account and for the Candler Dock & Dredge Co.; and one 12,000 d.w.t. steamer Hull No. 274, for the Pittsburgh Steamship Co. This latter vessel will be 580 feet long, 60 feet beam, and 19 feet loaded draft. She will have a 2250 I. H. P. triple expansion engine, and 3 Scotch boilers 14 feet diameter and 12 feet long. Her keel will be laid 10th January, 1930, and she will be delivered April 15, 1930.

Two Diesel Yachts

The Defoe Boat & Motor Works, Bay City, Michigan, report contracts No. 138 and No. 139 for steel yachts. Number 138 is for an undisclosed owner and will be 153 ft. x 24 ft. x 9 ft. 6 in. with 1000 h.p. in diesel engines driving her at 15 m.p.h. Number 139 is for Thos. M. Howell of New York City, and will be 160 ft. x 24 ft. x 8 ft. with 1300 h.p. in diesels driving her at 17 m.p.h.

Contracts For Twenty Millions

The New York Shipbuilding Co., Camden, N.J., has closed contracts No.394 to No.397 for four passenger and cargo steamers for the Export Steamship Corporation of New York as announced in September Pacific Marine Review. These vessels will be 450 feet length between perpendiculars, 61 feet 6 inches beam, and 42 feet 3 inches moulded depth. They will be powered with geared turbines 6300 shaft horsepower, single screw, for a service speed of 16 knots. The four vessels will cost $8,900,000.

This yard has closed also contract No. 399 for 10,000 ton displacement cruiser for the U.S. Navy to cost within $12,903,200 exclusive of armor and armament.

To Propose New Fireboat for San Francisco

According to a report recently made public, Acting Chief Brennan of the San Francisco Fire Department is drawing up plans for the betterment of the fire protection system along the waterfront. Strong recommendation will be made to the Supervisors for the appropriation of funds for the building of two modern, speedy fireboats to replace the present steam-powered fireboats Denis T. Sullivan and David Scannell. While admitting that the present craft are efficiently operated, the present steam plant present a constant expense and the boats are lacking in speed and many of the modern features embodied in the newer type of fire fighting craft.

Survey Tender

The U. S. Coast & Geodetic Survey of the Department of Commerce have invited bids on a diesel propelled steel survey tender of the following characteristics: length over all, 77 ft. 6 in.; length between perpendiculars, 66 ft. 8 in.; beam moulded, 15 ft. 6 in.; minimum depth, main deck beam at side, 10 ft. 3 in.; salt water displacement at 6 ft. 0 in. mean draft approx. 90 tons; draft light 5 ft. 0 in., propelling engine direct reversing diesel 110 h.p. at speed not exceeding 365 r.p.m. Bids will be received up to 2 p.m. October 5th, 1929, at the office of the Survey, Washington, D.C. Standard forms for bids, specifications, and instructions to bidders may be obtained from any Coast & Geodetic Survey Office.

Tanker Fleet Planned by Oil Line.

According to reports from reliable sources, the Standard Shipping Company, 25 Broadway, New York, subsidiary of the Standard Oil Company (N.J.) has plans under way for the construction of ten to twelve 15,000-ton oil tankers for the intercoastal trade. It is hoped that orders for several of these will be let to Pacific Coast shipbuilding plants. The vessels will cost about $2,000,000 each.

More Ferryboats for Puget Sound.

The Kitsap County Transportation Company, operating ferry services out of Seattle to several ports on Puget Sound, and subsidiary of the W. B. Foshay Co., is to ask bids for building of two new ferries to cost over $500,000. Captain J. L. Anderson is president of the ferry company. According to report received from Seattle, one boat is to be of wooden construction and one of steel, and both are to be powered with diesel engines. Each boat will be about 200 feet in length with capacity for 80 automobiles and 1000 passengers. The Lake Washington Shipyards built the wooden ferryboat Bainbridge for this company last year, and the new boats will probably be of similar construction. (The Bainbridge was fully described in the September 1928 issue of Pacific Marine Review.)

New Coastwise Vessel for Atlantic.

According to reports from New York, the New England Steamship Company, with New York offices at Pier 14, North River, plans the construction of two passenger and freight vessels for the New York-Providence run. The vessels will be about 350 feet long, 65 feet beam, 18 feet depth, with cargo capacity of 3000 deadweight tons. The new vessels will be similar to the Chester W. Chapin now operated by the company.

New York Oil Company To Build New Tonnage

The Sinclair Navigation Company of 45 Nassau Street, New York, has called for bids from Atlantic Coast shipbuilders for the construction of two tank steamers of 431 feet length between perpendiculars.

This company is said to be planning also the construction of two

diesel-powered tank barges for coastwise or canal service and to be of 2500 and 5000 barrels capacity, respectively.

Rehearing Granted on Ship Construction Loan Application

The application of the Hudson River Navigation Corporation of New York for a loan from the Shipping Board to aid in the construction of two motorships for use in trade between New York and Jacksonville, Florida, has been held open for rehearing at the request of the company. It was explained that the original application of this corporation for a loan was rejected on the ground that the ships to be built would be unsuited for ocean trade and as naval auxiliaries. A revised design was submitted and the application was scheduled for a hearing on a second recommendation that the ships would be acceptable, it was stated at the Shipping Board offices in Washington.

Sun Yard May Receive Order For Sister Ships.

The American South African Line, Inc., 39 Cortlandt Street, New York, is reported to be negotiating with the Sun Shipbuilding & Drydock Co. of Chester, Pennsylvania, with the idea of ordering a sister ship to the motor vessel now under construction for South African service which is scheduled for delivery before the end of this year.

The motorship now under construction at Chester is 450 between perpendiculars, 61 feet 6 inches beam, 26 feet loaded draft. She is to be powered with two sets of Sun-Doxford diesel engines to give a speed of 13 knots. All auxiliaries are to be motor driven. There will be passenger accommodations for 60 persons.

Panama Mail Program

Panama Mail Steamship Company officials have recently been in serious conference with officials of W. R. Grace & Co. of the United States Shipping Board and of the U. S. Post Office Department over proposals to build five express passenger liners for their San Francisco-Central America-New York service. It is understood that these vessels proposed will be 18 knot liners of about 20,000 tons displacement, to cost approximately $5,000,000 each.

According to advices received from Washington, a sub-committee of the Postoffice Department has recommended to the Lamont Committee on September 16 the approval of the establishment of a mail route between the west coast of the United States and South America so as to provide mail pay on that run for the Grace Steamship Line.

Dollar Loan Approved

The United States Shipping Board, at Washington, on September 25 approved a loan to the Dollar Steamship Company of San Francisco under the Merchant Marine Act, 1928, for $10,765,000, representing three-quarters of the cost of construction of two passenger and freight liners for the round-the-world service.

Order for the two vessels has been let to the Newport News Shipbuilding & Drydock Corporation, one to be delivered October 1, 1931, and the second on February 1, 1932.

According to specifications made public several months ago, these vessels are to be 615 feet between perpendiculars, 81 feet molded beam, 52 feet molded to shelter deck, 32 feet loaded draft. They are to be of 31 000 tons displacement and to have a deadweight cargo capacity of 17,400 tons and refrigerated cargo capacity of about 70,000 cubic feet. The vessels will be equipped to carry 332 first class passengers, 140 tourist, and 772 in Oriental steerage class. Turbo-electric machinery was chosen for the propulsion power of these vessels; steam to be supplied by Babcock & Wilcox boilers.

Palatial Yacht Planned by New York Architect

It is reported from New York that the well known architect of fine pleasure craft, Henry J. Gielow, Inc., 25 West 43rd Street, is designing a de luxe diesel yacht to have a length of 350 feet and to develop a speed of 20 knots. The yacht is to be equipped with every modern convenience and luxury to be found on the great ocean liners.

Lighter Bids to be Asked Shortly.

Plans and specifications have been sent to interested shipyards for the construction of a 90-ton steel derrick barge for the Merritt, Chapman & Scott Corporation of New York for its Los Angeles Harbor unit.

Bethlehem Receives Order

The Fore River Plant of the Bethlehem Shipbuilding Corporation, Ltd., at Quincy, Massachusetts, has been awarded a contract by the Atlantic, Gulf and West Indies Company of New York for a passenger vessel for the service of the New York and Porto Rico Line, a subsidiary.

Steamer Mexico To Be Reconditioned

The steamship Mexico, which was recently purchased by the Alaska Steamship Company from the Ward Line of New York, arrived in Seattle the middle of September and went to the West Seattle shops of the new owners to be reconditioned for the passenger and freight trade.

The steamship Mexico brought out new boilers for the steamship Victoria, steel plates, turbo-electric units, and four high pressure boilers for the steamship Alaska. The Alaska will be changed over to turbo-electric drive, increasing her speed. The boilers from the Alaska will be installed in the Mexico. The latter vessel will be entirely overhauled and her passenger accommodations refitted and she will be given the name Aleutian.

Two Diesel Tankers

The Sun Shipbuilding Company of Chester, Pa., report closing contracts No. 123 and No. 124 for construction of 13,400 d. w. t. single screw Sun-Doxford diesel engined tankers for the Sun Oil Company.

RECENT ORDERS FOR YACHTS, BARGES, TUGS.

American Bridge Company, Pittsburgh, Pa., has an order for a steel shallow draft river towboat hull 149 ft. x 34 ft. x 6 ft. for the Carnegie Steel Co.

Bath Iron Works, Bath, Maine, have five more steel yachts to build. These hulls not yet named are designated as contracts Nos. 134-135-136 137 and 138. They are to be each 190 feet long over all, 154 feet long on head water line, 26 feet beam and each will be powered with two 800 B. H. B. Bessemer diesels. Keels will be laid in November and December, 1929.

The Craig Shipbuilding Company, Long Beach, California, report contract for Hull No. 150, a yacht 118 ft. x 21 ft. x 9 ft. with two 275 B.H.P. Atlas Imperial diesels. Keel to be laid Sept. 15th, delivery approximately Jan. 15th. Owner, John Barrymore.

United Dry Docks, Inc., Mariners Harbor, New York, list Hull No. 792, Tugboat for the Henry Dubois Sons Company.

Two steel diesel tugs have been ordered from Spedden Shipbuilding Co., Baltimore, Md. One is to be 95 ft. x 22 ft. x 10 ft. 6 in. for the Oil Transfer Company, 17 Battery Place, New York, engines not yet decided. The other will be 57 ft. x 14 ft. 4 in. x 5 ft. 6 in. with 120 B. H. P. Fairbanks Morse engines for the Atlantic, Gulf and Pacific Company, New York.

Albina Marine Iron Works, Portland, Oregon, have under construction an all steel covered tow barge for the Crown Willamette Paper Co. for transport of paper stock from their mills to Portland. This hull is 130 ft. x 35 ft. x 6 ft. 6 inches.

Nunes Brothers, Sausalito, Calif. are building a 120 foot diesel yacht for Templeton Crocker.

On September 9th Mojean & Erikson shipyard at Tacoma laid the keel for a small wooden passenger and freight steamer for the Tacoma-Henderson Bay run of Lorenz and Bernston, Inc. This steamer will be of 150-tons gross. She will be fitted to take 300 passengers and 150 tons of freight.

Lake Washington Shipyards, Houghton, Washington, have an order for a diesel-powered cruiser for Stewart E. White, author and sportsman, of Hillsborough, Calif. The boat is to be 75 feet long and fitted with a 110-horsepower Washington-Estep diesel engine.

Prince Rupert Drydock & Shipyard, Prince Rupert, B.C., have had orders to change the size and equipment of the tug recently ordered by the Canadian Pacific Railway. Instead of a 90-ft. steam tug, the boat will be 71ft. 6in. long, and will be powered with a 300-brake horsepower diesel engine. The hull and house are to be of steel.

Consolidated Shipbuilding Corp., Morris Heights, New York, has orders on hand for eight yachts and cruisers and a number of tenders for larger pleasure craft. Two of these are over 100 ft. length.

Dravo Contracting Co., Pittsburgh, Pennsylvania, has an order for 20 steel hopper coal barges for Davison Coke & Iron Co., to be 175 by 26 by 11 ft. This plant has also entered order within the last month for 12 barges and one dredge for stock.

United Dry Docks, Inc., Mariner's Harbor, New York, has an order for a towboat from the Henry Dubois Sons Co.

NEWS FROM THE SHIPYARDS

Cook and Fandstrom, Ballard, Washington, has just completed the rebuilding of the passenger steamship Georgia to a tugboat at the cost of $80,000 for the Washington Tug and Barge Company of Seattle. The vessel is 125 feet long and she is powered with a 600 horsepower triple expansion steam engine. New decks and new deck machinery to fit her for the towing business were installed.

Albina Marine Iron Works, Portland, Oregon, delivered to the Department of Commerce the first of three diesel-electric lightships which have been under construction at the plant.

This plant recently completed the tender Westdahl for the United States Coast and Geodetic Survey, and an unusual feature of the job was the launching of the vessel at night. The Westdahl is 75 feet long, 17 feet beam, and 10 feet depth of hold. She is powered with a 140-horsepower Atlas-Imperial diesel engine. The vessel will be used in Alaskan waters and has a chart room and all equipment for her work in surveying coastal waters.

The 65-foot cruiser Amiga Mia, described in the July issue of Pacific Marine Review, was launched at the plant of Nunes Brothers, Sausalito, September 22, for Edwin J. Merry of San Francisco. The boat is powered by two 60-75 horsepower Hill diesel engines and is fitted for outside cruising. She can make a speed of 14 knots and has accommodations for eight passengers.

Bethlehem Shipbuilding Corporation, San Francisco, had the steamship Virginia on the Hunter's Point Drydock, to repair damages received in collision with the steamer Hermion early in September. The vessel had a large hole torn in her bow and a small hole in her bottom. Repairs cost about $100,000.

United Dry Docks Opens Yacht Basin

Creation of a yacht basin for the conditioning and storing of pleasure craft at its Shewan Plant, foot of 27th Street, Brooklyn, is announced by United Dry Docks, Inc.

At the Shewan Plant, one of the most convenient locations in the harbor, arrangements have been made to lay up and repair yachts of all sizes. Ample docking space is provided, together with sheltered storage room for smaller craft. The entire facilities of the Shewan yard will be available for yacht repairs.

The basin has the double advantage of easy accessibility and clean water, sufficiently deep to accommodate the larger pleasure boats. Quarters will be provided also for the comfort of yacht masters and engineers.

DELIVERIES

Two scows for Arundel Corp. by Bethlehem, Baltimore, in July.

Dolphin, 66ft. day cruiser for H. Murray, by Consolidated Shipbuilding Corp. in August.

Barge to Keystone Sand & Gravel Co. by Dravo Contracting Co., in August.

Myron C. Taylor, bulk freighter to Pittsburgh Steamship Co. by Great Lakes Engineering Works, August 22; steel dump scow to Dunbar & Sullivan Dredging Co., Aug. 8; scow to Great Lakes Eng. Works, Sept. 3.

Two steel cargo barges for Inland Waterways Corp. by Midland Barge Co.

Two carfloats to Erie R.R. Co. by New York Shipbuilding Co., Aug. 20, Sept. 4.

Tidemotor, steel oil barge for Tidewater Oil Co. by Sun Shipbuilding Co., Aug. 17.

Pittsburg, dredge hull to Atlantic, Gulf & Pacific Co. by United Dry Docks, Inc., Aug. 31.

Beverly, steel tug to U.S. Engineers, Philadelphia, by Chas. Ward Engineering Works.

Chief Seegay, fish packer for Canadian Fish & Cold Storage Co., by Prince Rupert Drydock & Shipyard, June 14; Ispaco I, pilchard seine boat for Island Packing Co., June 21.

Six cargo barges for Inland Waterways Corp. by American Bridge Co. in August.

William G. Clyde and Horace Johnson, bulk cargo vessels for Pittshurgh Steamship Co. by American Ship Building Co., Aug. 9 and Sept. 6.

Steel barge to Atlantic Transp. Co., and one to Western Maryland Ry. Co. by Bethlehem Shipbuilding Corp., Quincy, Mass., in July.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of September 1, 1929.

Pacific Coast

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length over-all; 30' beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28; launched 6/17/29.

Hull No. 113, lightship, sister to above; keel Sept. 1/28; launched 7/2/29.

Hull 114, lightship, sister to above; keel **Sept. 1/28 est.**

BALLARD MARINE RAILWAY COMPANY
Seattle, Washington.

Penquin, hull J-97, patrol boat for U. S. Bureau of Fisheries, Seattle; 130 L.B.P.; 27 beam; Union diesel eng.; deliver January/30.

CRAIG SHIPBUILDING CO.
Long Beach, Calif.

Purchasing Agent: F. W. Philpot.

Not named, hull 151, yacht for John Barrymore, Los Angeles; 118 L.B.P.; 21 beam; 9 loaded draft; 13 knots speed; 2 275-H.P. Atlas-Imperial diesel engs.; keel Sept. 15/29 est.; deliver Jan./30 est.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A. Wanner.

Itasca, No. 21, diesel-electric cutter for U.S. Coast Guard; 250x42x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.; keel laid; launch 11/1/29 est.

Sebago, No. 22, same as above; keel laid.

Saranac, No. 23, same as above.

J. C. JOHNSON'S SHIPYARD
Port Blakley, Wash.

Two scows for stock, 110x36x9.

LAKE WASHINGTON SHIPYARDS,
Houghton, Wn.

Purchasing Agent: A. R. Van Sant.

Foshay, hull 107, steel passenger and freight motorship for Northland Transportation Co., Seattle; 186x35 ft. beam; two 550-H.P. Washington-Estep diesel engs.; keel Mar. 4/29; launched July 27/29; deliver Sept. 15/29 est.

No name, hull 109, cruiser for Stewart Edward White, Hillsborough, Calif.; 75 ft. length; 110 H.P. Washington-Estep diesel eng.; deliver 5/1/30 est.

THE MOORE DRY DOCK CO.
Oakland, Calif.

Hull 179, steel carfloat for Atchison, Topeka & Santa Fe Ry. Co.; 260 L.B.P.; 38 beam; 7'6" draft; 1000 D.W.T.; keel 10/2/29 est.; launch 12/20/29 est.; deliver 1/11/30 est.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

Purchasing Agent: C. C. Labric.

Chief Seegay, hull 28, fish packer for Canadian Fish & Cold Storage Co., Prince Rupert, B.C.; 67 L.O.A.; 16'6" beam; 8'8" depth; 50 D.W.T.; 60 B.H.P. Fairbanks-Morse C.O. eng.; keel Mar. 15/29; launched June 6/29, **delivered June 14/29.**

Ispaco I, hull 29, pilchard seine boat for Island Packing Co., Victoria, B.C.; 65 L.O.A.; 17'5" beam; 7'8" depth; 75-H.P. Atlas-Imperial diesel eng.; keel Mar. 15/29. launched June 7/29; **delivered June 21/29.**

Ispaco II, hull 30, sister to above; keel Mar. 15/29; launched June 7/29.

Unnamed, hull 31, steel tug for Canadian National Railways; 71'6"x17'x9'6"; 300 B.H.P. diesel eng., keel 10/15/29 est.

Hull 32, steel car barge for Canadian National Railways, 184 x 40 x abt. 5 ft.; cap. 8 loaded cars.

Hulls 31 and 32 to be fabricated at yard; then shipped to Keloronа on Okanogan Lake for completion.

Hulls 33 to 36, inc., four wooden scows, 110 x 38 x 9'8"; keels 8/15/29 est.; deliver 10/15/29 est.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty-four cargo barges for Inland Waterways Corp.; 230x45x11 ft.; **10 delivered.**

Six sand and gravel barges for Rodgers Sand Co., 135 x 27 x 7'6".

One towboat hull for Carnegie Steel Co.; 149 x 34 x 6 ft.

AMERICAN SHIP BUILDING CO.,
Lorain, Ohio

Purchasing Agent: C. H. Hirsching.

William G. Clyde, hull 804, bulk cargo vessel for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12½ mi. speed; T.E eng. 2200 I.H.P.; 3 Scotch boilers, 14x12 ft.; keel Mar. 25/29, launched June 8/29; **delivered 8/9/29.**

Horace Johnson, hull 805, sister to above keel Apr. 8/29; **launched 7/20/29; delivered 9/6/29.**

BATH IRON WORKS
Bath, Maine

Paragon, hull 122, **twin screw steel** diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer; keel Dec. 3/28; launch Apr. 10/29 est.; deliver May 1/29 est.

Corsair, hull 124, twin screw steel steam turbo-electric yacht; 343x42x27ft., 18 ft. draft; 6000 S.H.P.; General Electric turbo-generators; Babcock & Wilcox boilers; keel June 11/29; launch Jan. /30 est.

Ebb, hull 126, fishing trawler for Bay State Fishing Co., Boston, Mass., Bath Iron Works design; 132'4" L.O.A.; 121'6" L.W.L.; 24 beam; 13 depth; 500-600 B.H.P. Winton diesel engs.; keel 6/18/29; launch Nov. /30 est.

Flow, hull 127, sister to above; keel 6/18/29; launch No. /30 est.

Malaina, hull 128, steel yacht; B. T. Dobson, designer; owner not named; 168 L.B.P.; 26 beam; 9 draft; twin Winton diesel engs.; 1600 I.H.P.; keel Dec. 5/29 est.

Notre Dame, hull 129, trawler for A. & P. Fish Co., Boston; 116 I.H.P.; 23 beam; 11 loaded draft; single screw; 500 I.H.P. Bessemer diesel eng.; keel 6/18/29; launch Nov. /30 est.

Fordham, hull 130, trawler; sister to above; keel 6/18/29; launch Nov. /30 est.

Unnamed, hull 131, steel aux. schr. yacht; Henry J. Gielow, designer; owner not named; 150 L.B.P.; 32 beam; single screw; 300 I.H.P. Bessemer diesel eng.; keel 10/1/29 est.

Not named, hull 132, twin screw diesel yacht for Henry J. Gielow, designer; 105 L.O.A.; 2 200-H.P. Bessemer diesels.

Not named, hull 133, twin screw diesel yacht; B. T. Dobson, designer; 125 L.O.A.; 2 400-H.P. Winton diesels.

Unnamed, hull 134, steel yacht, owner not named; 190 L.O.A.; 154 L.W.L.; 26 beam; two 800 B.H.P. Bessemer diesels; keel Nov. /29 est.

Unnamed, hull 135, same as above.

Unnamed, hull 136, same as above.

Unnamed, hull 137, same as above.

Unnamed, hull 138, same as above.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Northampton, light cruiser CL-26, for United States Navy; 10,000 tons displacement; launch Sept. 7/29 est.

Berwindvale, Hull 1422, single-screw coal collier for **Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris,** designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers; launched June 8/29.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Hull 1425, steel coasting vessel for Seaboard Shipping Co.; 450 gr. tons; launched May 29/29.

Hull 1426, steel barge for Gulf Refining Co.

Hulls 4252-54, three steel barges for Atlantic Transport Co. 700 Gr. T. ea.; **one delivered.**

Hulls 6139-40, two steel barges for Western Maryland Ry. Co., 499 Gr. T. ea.; **one delivered.**

BETHLEHEM SHIPBUILDING CORP., LTD.,
Baltimore, Md.

Hull 4240, steel 3-track carfloat for Western Maryland Railway; 325 x 38'6" x 10'8"; launched May 1/29.

Hull 4241, same as above.

Hull 4242, same as above.

Hull 4243, steel barge for Western Maryland Rly. Co

Hulls 4244-4251, 8 scows for Arundel Corp.; **2 delivered.**

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; Winton engs.; General Electric generators and motors; keel Jan. 30/29; launch July 1/29 est.

No. 116, same as above; keel Feb. 6/29; launch Sept. 1/29 est.

No. 117, same as above; keel May 1/29; launch Dec. 1/29 est.

One all-welded tanker for stock.

One all-welded tanker.

COLLINGWOOD SHIPYARDS, Ltd.
Collingwood, Ontario.

Purchasing Agent. E. Podmore.

No name, hull 83, tug for Toronto Harbor Comm.; 100 x 25 x 12'6"; 11 loaded speed; T E. engs. 1000 I.H.P.; Scotch boilers, 195 lbs. press.; keel July 25/29.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2940, 154-ft. cruiser for Anson W. Hard, of New York City; 2 Winton diesel engines.

Hull 2942, 24-ft. coupe yacht tender for above; 1 Chrysler engine.

Hulls 2944, 2945, and 2946, three 30-ft. coupe yacht tenders for yachts now building at Pusey & Jones; 106 H.P. Chrysler engines.

Hulls 2947, 2948, and 2949, three 26-ft. open crews' launches for yachts now building at Pusey & Jones· 65 H.P. Chrysler engines.

Hulls 2950 and 2951, two 20-ft. crew's tenders for yachts now building at Pusey & Jones; 12 H.P Kermath engines.

Hulls 2952, 2953, and 2954, three 24-ft. life boats for yachts now building at Pusey & Jones.

Hull 2957, 75-ft. cruiser for E. F. Clark, Youngstown, Ohio; 2 300-H.P. Speedway engines.

Hull 2960, 135-ft. steel diesel yacht for a prominent New York yachtsman; 2 600 H P Treiber diesel engines.

Hull 2961, 75-ft. cruiser for Jeremiah Milbank of New York City; 2 Winton engines.

Hull 2962, 80-ft. cruiser for J. T. McMillan, Detroit, 2 300 H.P. Speedway engines.

Hull 2963, 50-foot cruiser for A. E. Walbridge of New York City; 1 Sterling engine.

Hull 2964 75-ft. cruiser for G. M. Moffett of New York City; 2 Winton engines.

Hull 2965, 70-ft commuter boat for D. W. Dilworth of New York City; 2 300-H P. Speedway engines.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W. E. Whitehouse.

Olive K., hull 133, steel yacht for C. F. Kettering, Detroit; 169 L.B.P.; 26 beam; 12 loaded draft; 15 knots speed; 600 D W.T.; 1000 I H P. diesel engs.; keel Jan. 15/29; launched 9/5/29; deliver 10/1/29 est.

Not named, hull 136, steel yacht for A. V. Davis, New York; 138'6" L.B.P.; 18 beam 5 loaded draft; 20 M.P.H.; 150 D W.T.; 1400 I H P. diesel engs.; keel July 15/29; launch Oct. 1/29 est.; deliver Apr 15/30 est.

Marnell, hull 137, steel yacht for M. H. Alworth, Duluth; 135 L.B P.; 22 beam; 6'9" draft; 14 M.P.H.; 175 D.W.T.; 600 I.H.P. diesel engs.; keel Apr. 15/29; launch Oct. 15/29 est.; deliver Nov. 1/29 est.

Not named, hull 138, steel yacht, owner not named; 153 L B.P.; 24 beam; 9'6" loaded draft; 15 M.P.H.; 450 D.W.T.; 1000 I.H P. diesel eng.

Not named, hull 139, steel yacht for Thos. M. Howell, New York City; 160 L B P 24'6" beam; 8 loaded draft; 17 M.P.H.; 500 D.W.T.; 1300 I.H.P. diesel eng.

DRAVO CONTRACTING COMPANY,
Pittsburg, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'6" x 26'6" x 5' 6".

Hulls 821 to 825 inc.; 5 deck scows for New York Central R.R.; 100'x33'8"x9'7" **4 delivered.**

Hull 832, steel oil barge for Atlantic, Gulf & Pac. Co., 100x30x 9 ft.

Hull 833, steel floating dry dock for Warner Co., Philadelphia.

Hulls 838-843 inc., 6 standard sand and gravel barges for stock; **3 delivered.**

Hulls 844-855 incl., 12 standard sand and gravel barges for stock; 100x26x6'6"; **3 delivered.**

Hull 856, steel oil barge for Atlantic, Gulf & Pacific Co.

Hulls 899-906 incl., 8 sand and gravel barges for Keystone Sand & Gravel Co.; 135x27x8'; **1 delivered.**

Hull 908, 909, two steel hull whirler derrick boats for U. S. Engineers Office, Memphis.

Hulls 910-913 inc., four steel grain barges for Western Stevedoring Co., 130x 30x16'6".

Hull 916, steel hull floating grain elevator for Western Stevedoring Co.

Hulls 826-829 incl., 4 dump scows for Geo. H Breymann & Bros.; 1500 cu. yd. capacity.

Hulls 886-892 incl., 7 steel sand and gravel barges for Arundel Corp.; 130x34x9 ft.

Hulls 917-922 incl., 6 standard sand and gravel barges for stock; 130x30x7'6".

Hulls 923-928 incl., 6 standard sand and gravel barges for stock; 100 x 26 x 8'6".

Hull 929, ladder type sand and gravel dredge for stock.

Hulls 930-949 incl. 20 steel hopper coal barges for Davison Coke and Iron Co.; 175x26x11 ft.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 111, steel welded barge for O'Brien Bros.; 120 x 36 ft.; 1200 D.W.T.

Hull 112, barge for Venezuela Gulf Oil Co.; 80 x 24 x 6 ft.

GREAT LAKES ENGINEERING WORKS,
River Rouge, Michigan

Myron C. Taylor, hull 269, bulk freighter for Pittsburgh Steamship Co.; 580 L.B.P.; 60 beam; 19 loaded draft; 12 mi. speed; 12,000 gr. tons; TE engs. 2250 I H.P. 2 W.T. boilers; keel Mar. 14/29; launched July 15/29; **delivered Aug. 22/29.**

Hull 271, steel dump scow for Dumbar

& Sullivan Dredg. Co.: 168 x 40 ft.: keel 5/29/29; launched 8/7/29; delivered 8/8/29.

Service, hull 272, scow for Great Lakes Eng. Works; 80 L.B.P.; 29'6" beam, launched 8/27/29; delivered 9/3/29.

Hull 273, scow for Candler Dock & Dredge Co., Detroit; 60 x 28 ft.; launch 9/29/29 est.; deliver 9/30/29 est.

Not named, hull 274, steamship for Pittsburgh Steamship Co.; 580 L.B.P. 60 beam; 19 loaded draft; 12 mi. speed; 12,000 D.W.T.; T. E. engines, 2250 I.H.P.; 3 Scotch boilers 14' I.D. x 12' long; keel 9/30/29 est.; launch 1/10/30 est.; deliver 4/15/30 est.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1677, track barge for Yourtel-Roberts Sand Co., Chester, Ill.; 195x30x6'6"; keel July 15/29; launch and deliver 9/25/29 est.

Hulls 1673-1676, four combination cargo and oil barges for American Barge Line Co., Louisville, Ky.; 150x35x11'; one keel 5/10/29; keel 6/5/29; launch one 9/7/29 est.; one 9/20/29 est.

Hull 1661, steel hull, steam towboat, for stock; 148x30x5 ft.; keel Aug. 20/29.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

City of Saginaw, hull 246, car ferry for Pere Marquette Rail; Co.; 368 L.B.P. 57 beam; 17 loaded draft; 18 m. speed; 2 turbines: 3600 I.H.P. each; 4 Babcock & Wilcox W.T. boilers; keel Mar. 4/29; launch Aug. 6/29 est.

City of Flint, hull 247, car ferry, sister to above; keel May 1/29.

Reality, hull 248, steel yacht, owner not named; 78 long; 15 beam; 8'9" depth; 6' draft; 150 H.P. Fairbanks - Morse eng.; keel June 12/29; launch Aug. 3/29 est.

Hull 251, derrick barge for T. L. Durocher, Detour, Mich.

Hull 252, same as above.

MIDLAND BARGE COMPANY
Midland, Pa.

Five steel cargo barges for Inland Waterways Corp.; 230x45x11 ft.; 2 delivered.

One steel hull for New York State Canal Comm.; 106x30x7 ft.

Five steel barges for N.Y. State Canal Comm.; 75 x 25 x 5'6"; 4 keels laid.

One barge for M. H. Treadwell Co., New York; 115x34x9'11".

One barge for M. H. Treadwell Co., New York; 106 x 30 x 7 ft.

Eight barges for above; 40x13x4.

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Stadacona, hull 24, bulk freighter for Canada Steamship Lines, Ltd., Montreal; 582 L.B.P.; 60 beam; 20 loaded draft; 11 knots speed; 12,000 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 Scotch boilers; 15'3" dia x 11'6" lg.; keel Apr. 17/29; launch 9/19/29 est.; deliver 10/28/29 est.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, R. L. Baldwin.

Hull 200, towboat, owner not named; 56x14x5'6"; keel July 15/29.

Hulls 201-4 inc., four deck barges for stock; 130x32x8 ft.; keels laid 6/24, 7/1, 7/6, 7/12; launched 7/24, 7/25, 8/6, 8/7.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; launched Sept. 7/29; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Pennsylvania, hull 329, 18 - knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Oct. 15/28; launched July 10/29; deliver Oct./29 est.

Not named, hull 337, passenger liner for A.G.W.I. Nav. Co., New York; 508 x 70'9" x 39'; 15,380 tons displ.; 16,000 S.H.P.; 20 knots speed; turbo-elec. drive; keel July 23/29.

Not named, hull 338, sister to above; keel July 8/29.

NEW YORK SHIPBUILDING CO.
Camden, N. J.

Purchasing Agent: J. W. Meeker.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; launched Jan. 23/29; deliver July 9/29 est.

Chester, light cruiser CL- 27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; launched 7/3/29; deliver June 13/30 est.

Santa Clara, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'9" beam; 37'5" depth; General Electric turbo-electric machinery; keel Feb. 4/29; launch Nov./29 est.; deliver Apr./30 est.

Hull 390, carfloat for Erie R.R. Co.; 366x38x10'5"; keel 5/29/29; launched 8/10/29; delivered 8/20/29.

Hull 391, same as above; keel May/29; **launched 8/24/29; delivered 9/4/29.**

Hull 392, same as above; keel June 26/29.

Hull 393, same as above; keel June 26/29.

Not named, hull 394, passenger and cargo steamers for Export Steamship Corp., New York; 450x61'6"x42'3".

Not named, hull 395, sister to above.

Not named, hull 396, sister to above.

Not named, hull 397, sister to above.

Hull 298, cement barge for International Cement Corp.; 156'x37'4"x13'; keel July 22/29; launch 9/16/29 est.; deliver 9/30/- launch Aug. 20/29 est.; deliver Sept. 15/29 29 est.

Not named, hull 399, light cruiser No. 35 for United States Navy; 10,000 tons displacement.

THE PUSEY & JONES CORP., Wilmington, Del.

Purchasing Agent: James Bradford.

Nakboda, hull 1040, yacht for Fred J. Fisher, Detroit; 236 L.O.A.; 34 beam; 19 depth; 12'6" draft; 2 1100 H.P diesel engs.; keel Feb. 12/29; **launched 8/20/29;** deliver 11/15/29 est.

Rene, hull 1041, yacht for Alfred P. Sloan, Jr., New York; same as above; keel Feb. 12/29; launch 9/15/29 est.; deliver 12/1/29 est.

Cambriona, hull 1042, yacht for owner not named; same as above; keel Mar. 12/29; launch 10/15/29 est.; deliver 12/29 est.

Lotusland, hull 1043, twin screw diesel yacht, ordered by Cox & Stevens, Inc., New York; 168'9" long, 28' beam; two 500-B.H.P. diesel eng.; keel June 13/29; deliver Dec /29 est.

THE SPEAR ENGINEERS, INC., Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor, keel Aug. 18/28.

City of Norfolk, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P., keel Feb. 1/29; launch July 30/29 est.

SPEDDEN SHIPBUILDING CO. Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Argos, hull 265, steel hull, steam driven, patrol vessel for Supervisors of New York Harbor, 39 Whitehall Street, New York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam; 10'1½" mean draft; T. E. engs.; Babcock & Wilcox W.T. boilers; keel Apr. 6/29; launch 10/5/29 est.; deliver 12/12/29 est.

Not named, hull 266, steel hull freight and passenger tug for U. S. Dept. of Public Health, Boston; 91 L.O.A.; 20 molded beam; 9 draft; 350 H.P. Standard diesel eng.

Not named, hull 267, steel hull diesel tugboat for Oil Transfer Co., 17 Battery Place, New York; 95 L.O.A.; 22 beam; 10'6" loaded draft; eng. not decided.

Not named, hull 268, steel hull diesel tugboat for Atlantic, Gulf & Pacific Co., New York; 57 L.O.A.; 14'4" beam; 5'6" loaded draft; 120 H.P. Fairbanks-Morse diesel eng.

SUN SHIPBUILDING COMPANY, Chester, Penn.

Purchasing Agent: H. W. Scott.

City of New York, hull 116, passenger and freight motorship for American South African Line, Inc., New York; 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs.; keel Mar. 14/29; launch Sept. 14/29 est.; deliver Nov. 15/29 est.

Not named, hull 120, single-screw, diesel tanker for Sun Oil Co., 13,400 D.W.T.; keel 6/5/29, launch 10/15/29 est.; deliver 11/30/29 est.

No name, hull 122, sister to above.

Not named, hull 123, sister to above.

Not named, hull 124, sister to above.

Tidemotor, hull 121, steel oil barge for Tidewater Oil Co., New York; 188'6" x 31' x 11'6"; 6000 bbls. capacity on 9' draft; keel 5/20/29; **launched 8/6/29; delivered 8/17/29.**

TOLEDO SHIPBUILDING CO., Toledo, Ohio.

Purchasing Agent, Otto Hall.

Not named, hull 182, fire boat for City of Detroit; 125 L.B.P.; 29 beam; 10 loaded draft; 14 mi speed; comp. engs.; 950 I.H.P.; 2 B. & W. boilers; deliver Aug./29 est.

Not named, hull 183, steel ferry for Wabash Rly. Co.

UNITED DRY DOCKS, Inc. Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Pittsburg, hull 784, dredge hull for Atlantic, Gulf & Pacific Co.; 162 L.B.P.; 44 beam; 15 loaded **draft; keel Feb. 26/29;** launched 6/14/29; **delivered Aug. 31/29.**

Unnamed, hull 790, tug for Standard Transp. Co., New York; 91'6"x22'x10'9"; 12 loaded speed; comp. eng. 500 I.H.P., 1 Scotch boiler; 12'6"x11'; keel June 29/29; launch 9/16/29 est.; deliver 10/20/29 est.

Unnamed, hull 791, tug, sister to above; keel June 29/29; launch 9/23/29 est.; deliver [illegible]/29 est.

Not named, hull 792, tugboat for Henry D[illegible] Co.

THE CHARLES WARD ENGINEERING WORKS Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Beverly, hull 80, steel tug, U.S. Engineers, Philadelphia; 65'6"x17'x7'7½"; keel May 4/29; **launched 8/6/29; delivered 8/20/29.**

Unique, hull 81, yacht for Harold M. Ward, Charleston; 50 x 12 x 4 ft.; keel June 4/29.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD., Union Plant

Drydock, clean, paint, misc. repairs: Tahiti, La Perla, Paul Shoup, Golden Age, San Jose, Plow City, Limon, Golden Bear, West Mahwah, Solana, Capt. A. F. Lucas, sch. Florence Olson, yachts Galatea, Alpha, tug Sea King, dredger Hercules, ms. Charlie Watson, stmrs. Port Angeles, J. B. Stetson, tug Humboldt, ferry San Mateo, yacht Elia, barge Kern, Harbor Dump Barge No. 2. Boiler repairs: Broad Arrow. Pipe repairs: Astral, Calmar. Repair steering eng.: m.s. Lycia. Make and furnish 2 L.P. piston rings: Eagle. Parts for L.P. turbine: President Grant, President Lincoln. Alterations to flue gas system: K. R. Kingsbury. 4 capstans: W. S. Miller and H. M. Storey. Furnish and install ventilators; Paris City. H.P. piston rod and top nut: H. M. Storey. Propeller repairs: Robert Johnson, tug Standard No. 1. Miscellaneous supplies and repairs: whalers Traveler, Lansing, strs. and m.s. Los Angeles, Silverlarch, Caliche, Nordanger, Mongolia, Nora, Hamlin F. McCormick, Finnanger, Romanstar, Dilworth, Emma Alexander, Manoa, Wairuna, San Jose, Point Fermin, Montezuma, Point Reyes, Mongolia, H. F. Hillman, I. C. Fitzsimmons, Washington, Point San Pedro, San Mateo, California, Point Montara, S. C. T. Dodd, Maunganui, Katherine, King Coal Barge No. 3, Mukilteo.

CRAIG SHIPBUILDING CO., Long Beach, Calif.

Engine repairs: tanker Torres. Drydock and paint: yachts Haida, Black Swan. Hull repairs: yacht Windward.

COLLINGWOOD SHIPYARDS, LTD., Collingwood, Ontario

Two new blades mounts on steamship Caribou for Dominion Transp. Co., Ltd.

PRINCE RUPERT DRYDOCK & SHIPYARD, Prince Rupert, B.C.

Docked, cleaned, painted, annual overhaul: C. G. S. Birnie. Docked, cleaned, painted, hull repairs: snagboat Bobolink, dredge Lion. Docked, cleaned, painted, misc. hull and engine repairs: 11 fishing boats. Misc. hull and engine repairs not requiring docking: 38 fishing boats. 96 commercial jobs.

U. S. NAVY YARD, Bremerton, Wash.

Misc. repairs and docking: California, West Virginia, Tennessee, Kennedy. Misc. repairs incident to operation as district craft: Mahopac, Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.

TODD DRY DOCKS, INC., Seattle, Wash.

Rudder repairs, etc.: Admiral Evans; Drydock, clean, paint, misc. repairs: Admiral Fiske, Marie Bakke, Brookdale (no repairs), Coya, Lakina. Drydock, misc. repairs: S. A. Perkins. Drydock for installation of new propeller: ferry Iroquois. Voyage repairs: President Grant. Misc. repairs: Cacique, tug Daniel Kern.

Who Did What —and How

THE [illegible]-masted schooner "Vigilant" of Hoquiam, Washington, pictured here, is powered with auxiliary machinery and is engaged in the lumber trade, recently loading at Hoquiam for Hong Kong.

The ship is owned and commanded by Captain [illegible] Peasley who is one of the main characters in Peter B. Kyne's well known "Cappy Ricks" stories.

The "Vigilant" uses Shell Products too. Both Captain Peasley

and the Engineer are well satisfied with both products and service.

The S.S. "Kersten Miles" [illegible] plies between Portland Oregon and Shanghai. She was recently loaded at Portland with Shell turbine oil.

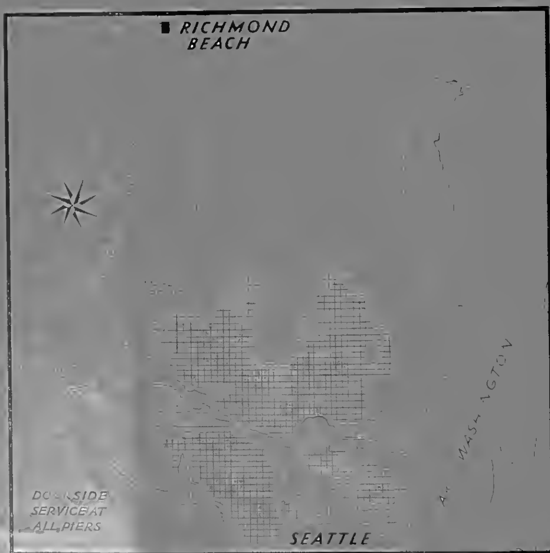
Captain Wienecke and Chief Engineer Kopff were very enthusiastic in their praise of Shell Marine Oil products, considering them superior to other brands previously used. Both the Captain and Chief Engineer will continue to load Shell

Products on each trip to Portland.

"We find wonderful service awaiting us at every port in the world by the Shell Oil Company," was the statement made by Mr. Kopff.

A wireless or [illegible] at [illegible] Marine Division, Shell Oil Company, Seattle [illegible] delivery of lubricants [illegible] upon your arrival

[T]he [S]eattle [S]hell [I]nstallations



The universal [illegible] Shell [illegible] their use by ships. [illegible] the explanation of Shell's [illegible] Seattle

Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

L. H. Hirschy was recently appointed chief engineer of the motorship West Cusseta of the South African Dispatch Line. Mr. Hirschy has had an ideal experience in preparation for this work. After serving an apprenticeship as marine machinist in the Fore River Plant of the Bethlehem Shipbuilding Corporation, Ltd., he put in ten years in the United States Navy, retiring as Lieutenant in 1919 to take up merchant marine service. He served as chief on the steamship Innoko, steamship Allenton, steamship Archer, steamship Robin Goodfellow, and the motorship Tampa, and was then appointed to the Technical Section of the United States Shipping Board where he worked on the Diesel Conversion Program.

At sea again as chief on the motorship West Honaker and the yacht Comoco, he returned to the Shipping Board for work on the conversion of the Courageous and the Triumph. Mr. Hirschy is a member of the American Society of Naval Engineers and an Associate Member of the Naval Institute.

L. H. Hirschy, recently appointed chief engineer of the motorship West Cusseta of the South African Dispatch Line.

L. E. Archer, Pacific Coast Manager of the Panama Pacific Line reports very gratifying results from a special service of an unusual sort rendered to an intercoastal passenger.

"When the Mongolia sailed from San Francisco on August 17 she had as a passenger Dr. William B. Doherty, 83 year old Louisville, Kentucky, surgeon, who had sustained a broken hip by slipping in a hotel bathtub, and was carried aboard the ship on a stretcher. The aged man yearned to rejoin his family in the East, but dared not undertake the journey by rail. On the Mongolia he was given the best stateroom, from which fittings were removed to make room for a special fracture bed from St. Mary's Hospital. This and other equipment gave the comforts of a private hospital room. Dr. W. B. Coakley, the ship's surgeon, took personal charge of the patient. Medical orderlies stood constant watch in his room, relieving each other every hour. The patient was turned on his side hourly. The room was artificially cooled while the ship was in the tropics, and heated as she steamed north. Dr. Doherty cheerily welcomed visitors, who were numerous. Two Catholic sisters and a priest, and eight children, were regular callers. 'On the voyage,' wired Captain Richardson of the Mongolia, 'Dr. Doherty's condition improved. On arrival he declared he owed his life to the care he received on shipboard. His son, Dr. William B. Doherty, Jr., leading surgeon at the New York Eye and Ear Infirmary, met him, and highly praised our special service. The patient, bright and happy, was removed by ambulance to a hospital.' "

One of the busiest executives along San Francisco's waterfront is Captain **F. W. Roberts**, supervisor of the Sausalito and Hyde Street routes of Southern Pacific-Golden Gate Ferries, Ltd.

Captain Roberts was recently appointed to his present position by Edward H. Maggard, vice-president and general manager of the companies.

Captain Roberts has been identified with San Francisco Bay transportation for 35 years. Prior to his recent appointment, Captain Roberts was master of the diesel-electric motorship Redwood Empire. When the Northwestern Pacific's auto ferry service was merged with the other companies to form Southern Pacific-Golden Gate Ferries, Ltd., Captain Roberts was transferred to the service of the new company. As supervisor of the Sausalito and Berkeley routes, Captain Roberts succeeded Captain C. C. Brown, who has just become an executive of the Marine Underwriters' Bureau.

Vice-President and General Manager **Edward H. Maggard** announced the appointment of A. C. Piercy as maintenance superintendent of Southern Pacific-Golden Gate Ferries, Ltd., in charge of all maintenance work on floating equipment, terminals, and other properties.

Piercy came up through the ranks. Upon graduating from the University of California he entered the Southern Pacific as machinist. He continued in various capacities with the S.P. until January, 1924, when he transferred to the Northwestern Pacific and was mechanical engineer with this company until drafted to his new position.

William A. Linn, one of the world's best known chief stewards, has resigned from the position as cuisine master aboard the liner Leviathan.

Difference in opinion as to the steward's department aboard the United States Line's greyhound of the Atlantic was reported as the reason for the resignation of Linn. He has been chief steward on the vessel for several years and is known to thousands of notable travelers the world over.

Linn stated, upon leaving the Leviathan, that he had no immediate plans, but was considering an offer

to become chief steward of a wealthy Long Island club.

After spending several weeks in San Francisco and other ports of the Pacific Coast, **Commander Sherwoode A. Taffinder,** port captain of the Panama Canal, returned home aboard the liner Venezuela.

Commander Taffinder has been head of the Canal pilots for two years, and will retain his present post for another twelve months. He is known to thousands of mariners who ply to all parts of the World through the Canal. While on the Paific Coast Commander Taffinder was the guest at several dinners staged in his honor by steamship executives and mariners.

John T. Willis, assistant freight traffic manager of the Panama Mail Steamship Company, reported upon his return from a trip around the country, where he talked with freight and steamship executives, that all agreed that 1930 promises to eclipse former years in steamship activities.

Ernest Sonnefleth, chief steward of the liner Venezuela, is on leave of absence after serving on the intercoastal passenger liner continuously for two years. He was succeeded by **James Howard Crain,** formerly with the Pacific Steamship Company running to Alaskan ports.

Merrill Johnson, port engineer of the Panama Mail Line, is receiving congratulations from his many hundreds of friends in the marine engineering world. Johnson slipped away to New York to claim as his bride Miss Marjorie Jones, daughter of Frank L. Jones, widely-known New York newspaper editor.

Each arrival of a ship in San Francisco is the occasion for some member of the engine room crew 'phoning Johnson, wishing him luck.

Captain Hugh Ellison, who was formerly assistant to Captain Heath, superintendent of the steamer division of the Southern Pacific Company, is now in charge of the Mission Street Terminal of the Southern Pacific-Golden Gate Ferries, San Francisco.

The port lookout station of the Marine Dept. of the San Francisco Chamber of Commerce is now located at end of Pier 45, the longest pier on the Pacific Coast. The lookout station that reports the arrival and sailing of all craft in and out of the

Captain Sherwoode A. Taffinder, port captain of the Panama Canal, who has been a recent visitor in San Francisco and other Pacific Coast ports.

Golden Gate as well as keeping an "eye" on the entire bay, is situated on the top of the pier shed and commands an unobstructed view of the bay, Golden Gate and up river.

Captain Eddie McCarthy, veteran lookout, is in charge of the station. The former station was located at the foot of Hyde Street.

A little more than a year ago a new sea lookout station at Point Lobos was opened, with modern apparatus for sighting ships and securing other nautical information. These two stations, coupled with the general headquarters of the

Merrill C. Johnson, port engineer at San Francisco for the Panama Mail Steamship Company, a recent benedict.

marine department of the Chamber of Commerce, give a marine reporting and information service second to none in the world. **Abe Marks,** manager, and **Artie Byers,** assistant manager, have been identified with the marine department of the Chamber of Commerce for more than a quarter of a century.

To the late **Jerry Daily,** beloved by mariners and shipping men the world over, goes the credit for establishing the marine bureau at San Francisco on its present firm foundation and efficient basis.

The former freighter **Sutransco,** purchased by the Admiral Line from the Transmarine Lines, has been re-christened the **Admiral Chase** to operate between California and Washington ports. The vessel was secured to replace the **Boobyalla** lost several months ago.

J. W. Kemp, well-known shipping man, has been named assistant to **H. J. Meehan,** in the Seattle offices of the United States Intercoastal Conference weighing and inspection service. The office is for the purpose of adjusting disputes between members of the conference in Seattle and Tacoma.

Captain Fred Anderson is again on the bridge of the round-the-world liner President Wilson, after being off for a voyage. During the lay-off, Captain Anderson with Mrs. Anderson paid a visit to his old home in Sweden.

A veteran of the sea, **Arthur W. Cooper,** chief engineer for the Shipowners' and Merchants "Red Stack" Tugboat Company, passed away September 12. He was chief engineer of the tug Sea Scout for many years. Cooper was well-known to deep sea mariners from many world ports, and his passing was received with regret by the marine fraternity along the Pacific Coast.

Chief Engineer Cooper before going "into tugboats" was with the old Pacific Mail Steamship Company, sailing to Hawaii and the Orient.

Captain Harry Miller, former Los Angeles port pilot, is seeking action looking toward the appointment of more pilots to handle shipping in and out of Los Angeles Harbor.

Captain Miller pointed out in his argument to **Mayor John C. Porter** that increased tonnage arriving and departing demanded that additional

pilots be appointed to facilitate the handling of ships.

Matt Lindsay, freight traffic manager of the Matson Navigation Company, accompanied by Mrs. Lindsay, is now on a European tour. This is Lindsay's first trip abroad since he became identified with Matson in the early days of that company. He will not return until late this month or early November.

President Hoover is reported to be favorably inclined to appoint Commissioner **Albert H. Denton,** member from the interior, chairman of the Shipping Board, to succeed **T. V. O'Connor,** who has been ill in a New York hospital for some time.

The move, according to Washington advices, is predicated upon the President desiring of promoting efficiency and harmony, and believes that this end will be realized by rotation of the chairmanship.

O'Connor was appointed chairman of the board in February, 1924. He has been a commissioner of the board since June 1921, and his term does not expire until 1934. O'Connor also has been president of the Emergency Fleet Corporation since October 1927, when he was elected to succeed Brigadier-General Dalton.

P. A. S. Franklin, potent head of the International Mercantile Marine, will not be a passenger aboard the Panama-Pacific liner **Pennsylvania** on the vessel's first trip to the Pacific early in November.

Franklin made the maiden voyage on the California and Virginia, and it was expected he would come out on the Pennsylvania. However, he is expected to make a quick trip overland, as it has been reported that there will be important changes made in the freight handling of the Panama-Pacific Line at Pacific Coast ports.

San Francisco shipping interests and the general public are eagerly awaiting Japan's finest passenger liner, the **Asama Maru,** scheduled to arrive on October 25. The vessel is the first of the three new motor liners built for the San Francisco-Oriental run of the Nippon Yusen Kaisha. In command of the Asama Maru will be **Captain G. Shinomiya,** formerly in command of the Taiyo Maru, but eight months ago he surrendered his command in order to travel back and forth on the largest Atlantic liners to gain first-hand knowledge of European passenger line operations.

Shipping men learned with regret that among the victims who lost their lives when the ill-fated airliner City of San Francisco crashed in the mountains of New Mexico was **Harris Livermore,** widely-known Eastern shipping official. Livermore was returning home on the ill-fated plane, after a business survey of shipping activities on the Pacific Coast. Livermore was president of the Coastwise Transportation Company of Boston and chairman of the maritime committee of the Boston Chamber of Commerce, as well as a member of the Boston Port Board.

James Howard Crain, recently appointed chief steward of the Panama Mail liner Venezuela. Crain was formerly steward on Admiral Line steamers in the Alaska run.

A boy and girl who plighted their troth fifty-five years ago, when the groom was a section hand in a North Pacific lumber camp on September 11, observed their fifty-fifth wedding anniversary.

The happy couple were **Captain and Mrs. Robert Dollar,** and the ceremony was fittingly observed in their beautiful home in San Rafael, Marin County, California.

The bride of more than a half century ago could look with pardonable pride at her husband, who, through adversities that were heaped upon many of his ventures, one of which occurred when Captain Dollar had passed his fiftieth birthday, is today recognized as the dean of the shipping world and a commanding figure in maritime activities to every leading world port.

Well merited promotion has been accorded **Al F. Zipf,** with his elevation to the vice-presidency and general managership of the Williams Line.

Zipf has been Pacific Coast manager of the Company, and when the American - Hawaiian Steamship Company, **Roger D. Lapham,** president, proposed to the board of directors that Zipf be made vice-president, the motion was unanimously carried.

Other promotions in the Williams Line was naming **Louis Shain,** general claims agent. He was formerly western claims agent. His new headquarters will be San Francisco.

J. A. Wells, formerly traffic manager in New York, has been named Atlantic Coast manager.

To confer with European managers, **Harry Brown,** vice-president of the Dyson Shipping Company at San Francisco, will be in Europe for six weeks. While absent he will interview heads of the Midland & Scotland Railway of Great Britain and the Reardon-Smith Line.

James E. Johnson, formerly connected with the Purchasing department of the Cunard Line, has joined the Consolidated Navigation Company in New York with the title of assistant manager. The company operate the Oriole Lines.

October 26, steamship men of San Francisco will celebrate the annual "Steamship Dinner."

John C. Rohlfs, manager of the marine department of the Standard Oil Company, has issued notices of the forthcoming event. The "Steamship Dinner" is the most brilliant annual function of the maritime world on the Pacific Coast, and leaders from all parts of the country congregate in San Francisco for the "big doings."

The good will party, sponsored by the San Francisco Chamber of Commerce, sailed away for ninety days of cruising and shore-side stays in the Orient and Australasia aboard the Matson liner **Malolo,** September 21.

C. C. Moore and **Robert Newton Lynch,** the latter vice-president and general manager of the San Francisco Chamber of Commerce, "captained" the party on the liner Malolo.

Institution of the intercoastal service of the **Shepard Steamship**

Company started the first of October with the departure of the freighter Sage Brush from San Francisco.

E. S. Clark, manager of the intercoastal service of the General Steamship Company, stated that a monthly service will be maintained by the Shepard Line, and the steamers will transit the voyage in 22 days.

Commands of the Panama-Pacific Line liners have been shifted with the placing of the new liner Pennsylvania on berth out of New York, October 19.

Captain H. A. T. Candy of the Virginia goes to the Pennsylvania, **Skipper George V. Richardson** of the Mongolia, who has been shoreside, commands the Virginia, and **Captain Robert Smith** takes the California. Smith has been chief officer of the liner California under Captain James E. Roberts.

Prof. A. M. Low, distinguished young British scientist and famous authority on sound waves, is now in Belfast with a commission to live aboard a British oil-burning vessel with the object of photographing, then phonographing, and finally eliminating noises aboard ships, thereby ensuring greater comfort to those who travel on liners competing for the blue ribbon of Atlantic travel.

He will, he explained, by regular absorption and refraction, attempt to eliminate most of the noises recorded by him during the trip, or at least try to render harmless to the health and comfort of human beings those noises which cannot be done away with completely. Phonograph recordings will be made of sounds and they will then be eliminated after location. The new White Star liner Britannic is to be noise-proofed by Prof. Low.

Thos. J. Maher, division inspector Coast and Geodetic Survey, San Francisco, announced that a new sea bottom searcher is to be built when bids are opened Oct. 3, for survey tender. The proposed vessel will be 77 feet long, 15 feet beam, draft six feet, and displacement of about 90 tons. It will be equipped with a direct reversing, 110 horsepower Diesel engine and the hull will be of steel construction.

The three coast guard cutters being built at the Oakland plant of the General Engineering and Drydock Company have been given their official names. The designations were received from Washington by Captain D. F. A. de Otte, division commander. The three vessels are to bear the names of eastern lakes, and are as follows: **Sebago,** after a lake in Maine; **Saranac,** after a lake in New York State; while the **Itasca** is named after a Minnesota lake.

The Richfield oil tanker Richfield is now in command of **Captain H. G. Morse,** who succeeded **Captain H. W. Lee.** Captain Morse was formerly chief officer of the fuel carrier. Captain Lee was skipper of the Richfield for several years.

Charles F. A. Mann, Northwest representative of Pacific Marine Review. Mr. Mann recently made an extended trip into Alaska waters on the motorship Aleutian Native.

J. S. Patterson is now chief engineer of the Dollar round-the-world liner President Polk. He was formerly chief of the President Hayes. First Assistant Engineer **Karl W. Herhert** succeeded Patterson on the President Hayes.

T. A. O'Brien, who has been for six years shore-side at Richmond for the Standard Oil Company, is now first assistant engineer on the tanker H. M. Storey, while **E. P. Hale** is on a vacation.

Andrew M. Thomsen has returned as chief engineer aboard the steamer Sutherland, after a vacation. During his lay-off, First Assistant Engineer **Peter J. Fitzpatrick** served as head man of the propulsion department.

After being "anchored" for twenty years in the Santa Marina Building, the **Masters' Benevolent Association** moved to the Dollar Bldg., San Francisco, and established headquarters in room 615. **Charles E. Polk** has been secretary of the association for more than fifteen years.

Among the officers standing at attention when the United States Naval Reserve flag was hoisted to the masthead of the American-Hawaiian freighter Kentuckian in San Francisco by Commander Geo. W. Bauer of the Twelfth Naval District were the following engineers who served in various capacities during the World War: Chief Engineer, **P. W. Boehncke, G. Gunderson,** first assistant engineer; **D. Swenson,** second assistant engineer, and **R. Christy,** third assistant engineer.

Death claimed a man whose ingenuity as a maker of lifeboats made him famous, when Captain **Andreas Petrus Lundin** passed away in Flushing, N.Y. He was sixty years of age.

Captain Lundin was born in Sweden, but as a young man came to the United States. He was responsible for the design of successful life-saving equipment for all types of vessels.

Daulton Mann, general manager of the Panama Mail Steamship Company, and **William A. Young** Jr., passenger traffic manager, have been in the East for more than a month regarding mail contracts and other matters dealing with the report that the company plans the construction of five new steamers for their New York-Central American-California service.

The most drastic inspection of life-saving apparatus and safety at sea appliances carried aboard American vessels of all descriptions will start this month in every port in the United States.

A special committee of the board of supervising inspectors of the United States Steamboat Inspection Service, has just been created for this gigantic task.

All life-saving appliances used on United States inspected vessels will be thoroughly scrutinized and tested, with special attention being directed toward lifeboats, life preservers, life-saving releasing gears and rafts.

Captain Arthur M. Self, one of the recently appointed bar pilots for the Port of San Francisco.

The committee will consist of **Dickerson N. Hoover**, supervising inspector-general of the United States steamboat inspection service, Washington, D.C., chairman; **John L. Crone**, supervising inspector N.Y.; **Alex O. Talcott**, supervising inspector, Norfolk; **Fred J. Meno**, supervising inspector, Detroit, and Captain **William Fisher**, supervising inspector of Seattle.

Arthur B. Swezey, Pacific Coast Manager of the Cunard Line, and one of the best liked and esteemed shipping men on the Coast, returned to San Francisco from a two months' trip to the Orient.

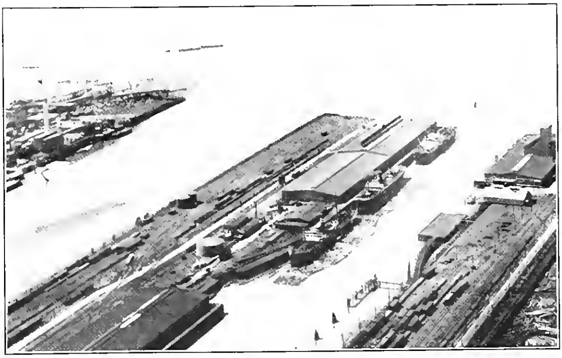
His trip was in connection with an agreement whereby the Cunard Line represents the Nippon Yusen Kaisha in Europe and the Japanese concern handles the business of the Cunard Line in the Orient.

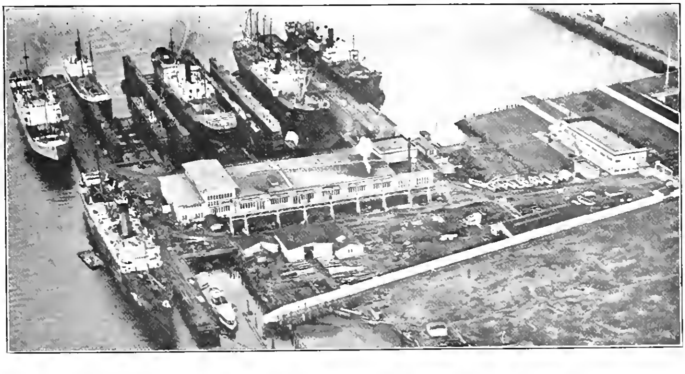
W. R. Lynch is now in charge of the Portland offices of Swayne & Hoyt. He succeeded **J. S. MacMahon**, who has been transferred to the San Francisco offices of the Company.

E. M. Murphy, marine superintendent; **Captain Thomas Healy** and other officers of the Alaska Steamship Company, are now in the East in connection with taking over the Ward Line passenger steamer Mexico. The Mexico was purchased to replace the steamer Aleutian, which foundered on Kodiak Island, Alaska, several months ago.

San Francisco **Propeller Club** held a banquet at the Clift Hotel on October 4. Over 250 members were present. Under the direction of **Karl Eber** a splendid program was presented. The club is becoming one of the influential maritime organizations of the Coast.

Captain G. Shinomiya who will be in command of the new Nippon Yusen Kaisha fast passenger motor liner Asama Maru on her maiden voyage through the Golden Gate.





At the left, a bird's-eye view of Todd Dry Docks at Seattle. This compact, efficient ship repair plant is giving excellent service to marine fleets of Puget Sound.

Above, is shown the new unit of the Shaeffer Terminals at Tacoma with three deepsea vessels alongside. Note the convenience with which logs can be handled directly from the water while general freight is being taken aboard from the terminal.

Trade, Traffic, and Shipping

(Section continued from Page 419)

Care of Perishable Cargoes

(Continued from Page 419)

but the air would soon purify itself when opened to the atmosphere.

To get some idea of the cost of the nitrogen gas as compared to the bananas, take a typical stowage. Bananas in crates may take up as much as four square feet of floor space; but ordinarily stowage, where the bunches are stowed on the end of the stems in the space with one or two bunches on their side on top, about 0.8 of a square foot per bunch serves for stowage. In a space 16 feet by 16 feet by 7 feet high, there are 1792 cubic feet. In this space there may be stowed 320 stems of bananas. At 50 to 53 pounds per stem, there would be 16,960 pounds, or 8.48 tons. At $27.50 freight per ton, the freight would be $233.20. Assuming that there were 1632 cubic feet of space in this compartment to be filled with nitrogen, it would take 8 bottles at say $2 a bottle or $16 to fill the space. Allow 8 bottles to make up leakage and we have $32 for gas, using the large quantity basis price or $3.75 per ton of fruit.

It appears at first glance that the nitrogen method has considerable merit as the refrigeration and refrigerating machinery is omitted, with considerable saving in weight of ship and considerable increase of speed with the same power, savings in interest, depreciation, upkeep, repairs, fuel for the refrigerating apparatus and for the ship, and a small reduction in personnel.

Onions

Fourcroy and Vanquelin obtained from the ordinary onion a white, acrid, volatile oil, albumen, much uncrystalled sugar and mucilage, phosphoric acid both free and combined with lime, acetic acid, lime citrate, and liguin. The oil consists largely of allal-sulphide $(C_3H_5)_2$ S.

The expressed juice of the onion is susceptible of vinous fermentaation on account of the carbohydrates present. Onions are susceptible to heating from the effect of chemical changes taking place, mold attacking the nitrogenous substances, fermentation of the carbohydrates, germination or starting of growth of the onion itself from excess moisture, rot from the destructive action of the rot fungus which usually begins at the neck. They may also be infected with onion maggots or onion flies which prey on the onion during its growth.

Heat is one of the enemies to be avoided. Heat aids the mold and rot fungus growth, assists the germination of the onion, and speeds up the fermentation of the juice. Therefore the onions should be stored in a very cool place. Fermentation and decomposition throw off heat which must be combatted by circulating air through the cargo storage to carry away the generated heat. Merely having an open ventilator to the space where the onions are stowed is not sufficient. There must be circulation of air. Circulation of air through the onion cargo is assisted by the use of net work sacks or lattice crates; but no amount of care in packing the onions will obviate the necessity of providing a lively circulation of air to carry off the heat, excess moisture, and the gas emanating from the volatile oil of the onion. It is customary to rig up a wind sail having a large orifice open to the wind and force the air down to the space where the onions are stowed. If fans are available they are used for the same purpose.

The destination of the ship with respect to the temperature and humidity of the air and the temperature of sea enters quite prominently into the transportation of the onion; for if the conditions are such that the onions and ship are cold at the start and the ship goes suddenly into a warm, moist climate, the introduction of warm moist air into the onion space as described under "Humidity and Dew Point" will bring about conditions that greatly facilitate the destruction of the onion by chemical changes.

To be safe under such extreme conditions it is better to resort to cold storage.

Cold storage of the onions requires that care be taken with temperature and humidity. The high water content (78.9 per cent.) of the onion necessitates that it be kept well above freezing. Also care must be taken to insure that the onions are not cooled too quickly or taken from the cold storage into atmospheric temperature too quickly, as rapid expansion or contraction of the moisture content will cause scald or brown spots to appear and the onion to spoil.

The humidity can be controlled by cooling the air in a separate chamber, precipitating out the moisture, and then allowing the cool, dried air to pass into the onion chamber through the fans. The process of supplying the air continuously will be better than the intermittent change, as then the danger of periodic variations of temperature and particularly variations of humidity and gas content can be avoided.

Oranges

On account of the high content of carbohydrates, oranges are naturally subject to destruction by fermentation. This process however, is not the one that gives the most trouble. Blue mold decay and sooty mold fungus are likely to develop on the orange in transit; and steamship carriers should get a bill of health for oranges before accepting them for shipment for the following reasons as given by the United States Department of Agriculture after an extensive investigation into orange shipment.

1. Oranges that are handled most simply, that is, the apparently sound brushed fruit, develop the least decay; while the fruit that is sorted from the same bins but has been injured in handling develops the greatest amount of decay.

2. The fruit, taken as a whole, that was shipped out promptly after packing developed little decay; while the fruit that was held before shipment developed a good deal of decay, the injury from the decay being least severe in the sound brushed fruit and greatest in the fruit that was mechanically injured. The increase in the decay in the apparently sound brushed fruit and washed fruit as a result of delay in shipping is probably due to the fact that it was not possible to eliminate all of the injured oranges in sorting the fruit from the bin.

3. If the fruit is uninjured when it leaves the packing house it is likely to arrive at destination in

comparatively sound condition, and, under adverse conditions, such as delay in shipping the fruit, there is less decay in apparently sound fruit than in oranges that have been injured by handling.

Blue mold decay is caused by the growth of a minute organism within the tissues of the fruit. Laboratory experiments have shown this organism to be a fungus of the genus Penicillium, which includes the familiar blue mold or mildew on bread, on the surface of canned fruit, and on other vegetable matter. Growth takes place within the orange, the blue mat on the skin being composed of the fruiting bodies made up of chains of spores massed together in great numbers. The fungus is spread by means of these spores, which, like the seeds of many higher plants, germinate and grow as soon as they find lodgment under favorable conditions for their development. They require heat and moisture, and when these are present growth proceeds at a very rapid rate. The blue mold fungus has not the power to penetrate the sound living tissue of a well grown fruit; hence, there must be a break or an abrasion of some kind in the skin through which the disease may find entrance. When growth has once started, even in a small way, the fungus is capable of killing the surrounding tissues and thus producing material on which to grow.

The sooty mold fungus grows in the so called honeydew exuded by the black scale. The honeydew from the black scale spreads out over the branches, leaves, and fruit and in severe manifestations the fungus which grows upon it makes the oranges black and unsightly. The fungus forms a thin, skin-like covering over the orange which is removed by washing or, in light attacks, by brushing the fruit. The washing process offers ideal conditions for the spread of blue mold.

Stem-end rot, unlike blue mold, is a fungus that apparently does not depend upon injuries or breaks in the skin through which to gain entrance to the tissues of the fruit.

It will be noticed that none of the above enumerated methods of decay are due to the natural ripening of the fruit nor due to the natural fermentation of the carbohydrates. Also for these methods of decay the carrier would appear to be free of responsibility if he otherwise used due care and diligence to avoid carelessness in stowage and refrigeration.

Oranges may be shipped either by the ventilation method or by cold storage where the temperatures and humidity permit; but considerable refrigeration equipment will be necessary to overcome the conditions of humidity and temperature at the Panama Canal, in fact almost the same amount that would serve for cold storage.

Again the previous history of the fruit becomes important. As it is not possible to pick the fruit, process and pack it, and deliver it to the ship's storage room without a lapse of several days, it seems to appear advisable at first glance that the fruit intended for long shipment should be precooled to a temperature of 35 to 40 degrees Fahrenheit. Otherwise decay that could be attributed to fermentation would have an opportunity to get well under way before being received by the carrier.

On account of the high moisture content of the oranges, care must be taken to keep the temperatures constant and above freezing. Also on account of the humidity and temperature at the Panama Canal the method of placing the cooling pipes in a separate compartment to precipitate the moisture and cool the air before it enters the stowage space is necessary. On account of the internal heat of the orange, the air at the top of the stowage space should be drawn off and fresh cooled dehydrated air supplied by fans continuously throughout the voyage.

There are no data available concerning the effect of nitrogen on the carriage of oranges; but Mr. Milani with his carbon dioxide process packed some lemons. Full details are not available but Mr. Mills the grower was very complimentary to Mr. Milani on the length of time the lemons kept and their condition at the end of the experiment. It must be stated, however, that Mr. Milani keeps fruit in carbon dioxide gas confined in containers which in turn are kept in cold storage.

Peanuts

Peanuts are usually carried under natural ventilation in dry holds, the sacks being arranged with tunnels between the rows to permit of ventilation throughout the cargo.

They are subject to mildew on account of the protein content, rancidity from the contact of light and air with the fats, heating from fermentation of the carbohydrates, and weevils from infection in the fields or packing house.

The principal difficulty is with mold; and under the heading Humidity and Dewpoint I discussed the source from which moisture comes to germinate the mold and make it destructive. The mold is a fungus growth that is present in all air. It circulates around until it lights on the bags of peanuts, but is harmless if kept free from moisture. The protein is the host which furnishes the food for the growth of the mold, which penetrates the skins of the peanuts as soon as it has moisture to germinate, sending its roots rapidly in all directions.

On account of being dried before shipping, peanuts will have not more than 8 per cent of moisture when delivered to the ship's side. Proper stowage requires that they have a space from 8 to 10 inches between them and the steel work of the bulkheads, ship's side and the deck above for the free circulation of air to prevent the starting of any of the natural troubles to which they are subject.

There are two doctrines covering the subject of ventilation of cargo ships, both based on the principle of air circulation and both pertinent to carrying cargoes of peanuts. These are:

Doctrine A. Holds that the vessels should be closed tight and the air within the vessel circulated mechanically by fans or blowers or other mechanical means. If these precautions are observed no trouble will arise by reason of the growth of mold.

As the holds are dark the probability of the fat content turning rancid is more or less remote.

On account of the low water content little trouble is to be expected from the fermentation of the carbohydrates; and should moisture be present in sufficient amount for this process it is still requisite that there be a yeast of some form to start it. On account of the fact that the peanuts are ripened under ground the probabilities are that the mold spores from the ground would become active before the wild yeast got a chance to start fermentation of the carbohydrates as most of the wild yeasts are present in that part of plant life which is above ground.

Doctrine B. Holds that the vessel should have ventilators at each end of the respective cargo spaces so arranged that the speed of the vessel or the passage of the wind will create a draft down one ventilator and up the other to keep the air cir-

culating within the spaces served by the ventilators.

(Note that both doctrines depend on the same principle that the air within the ship shall be kept in motion and to do this there must be space around and through the perishable cargo to permit the circulation of air.)

As peanuts originate to a considerable extent in China where of late years there have been disturbances of a political and economic nature, there is danger that they will be shipped in a condition whereby the moisture content might be high enough to furnish the moisture necessary to germinate the mold. In this case the use of fans to circulate the air vigorously would be necessary to carry off the moisture as it comes to the surface of the nuts. The outlets of the fans should be carried down into the lower bilges so the moisture would deposit on the cold parts of the ship that are below the water line.

(The End)

Hawaiian Air Wars

(Continued from Page 417)

ator, having served as a navy pilot during the war. Frank C. Atherton is president of Inter-Island Airways, and Arthur H. Armitage, vice-president and general manager of the Inter-Island Steam Navigation Company, is secretary and treasurer.

Too many conclusions cannot safely be drawn at this time from the affiliation of an airplane line with a steamship company. But the potentialities seem great. Steamship companies transport freight, mail, passengers; aside from a little express, freight must continue to move by steamers—on land by railways; mail and passengers are something else, however, and are likely to seek quicker media, especially as aviation becomes safer and keeps its engagements punctually. The history of the last century is the history of the transformation of space into time; cities are no longer so many miles apart, but so many hours. What men will do with the time they save need not be considered here; the fact remains that men do desire to save time; and the airplane, after electric communication by wire or through the air, is the greatest of time-savers. American railways, led by the Pennsylvania, have shown the way on land by linking themselves with airplanes; the delivery of mail by planes from trans-Atlantic liners is a new use of mechanisms of the air by those of the water; and the new Inter-Island Airways of Hawaii is one more contribution to the history of transportation.

Seattle Work Boat Notes

Frank & McCrary, Seattle, have the fishing boat Mitchie out on the ways for general repairs and are building a new fish boat. The Vista Miller, a cruiser owned by F. A. Miller of Seattle, is also on the ways at this yard for general reconditioning and for the installation of a 50-horsepower **Western-Enterprise** diesel in place of her present gasoline engine.

Grandy Boat Works have under construction a 27-foot towing launch for the Kaui Railroad Company of Port Allen, Kaui. This boat is a repeat order on one built two years ago. She will be powered with 16-horsepower **Eastern Standard** gas engine and will be used for towing pineapple barges.

This yard has on order a 38-foot cruiser for George Easter of Seattle to be completed March 1930. Power will be a **Hall-Scott** 100-horsepower gas engine.

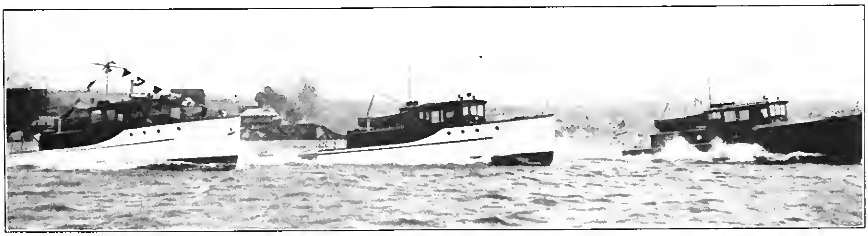
Lake Union Drydock & Machine Works, Seattle, recently performed a very interesting job on the rebuilding and reconditioning of the motorship Aleutian Native for the Kanaga Ranching Company. The boat was the former Portland fireboat Chief and she is fitted for a fox farm tender. Two **Washington-Estep** diesel engines of 200 horsepower each were installed, and a 44-horsepower auxiliary engine, a 15-horsepower electric anchor windlass, and one hoisting winch of 5-horsepower. **Allan Cunningham** of Seattle furnished the auxiliary machinery. The work of reconditioning this vessel amounted to about $100,-000.

Lake Washington Shipyards, Houghton, Wash., recently completed rebuilding and overhauling the steamship Tourist for the Puget Sound Navigation Company's Black Ball Ferry Lines. The Tourist is rebuilt as a modern freighter for operation on Puget Sound.

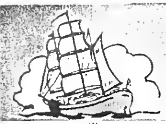
TRADE NOTE

The Oil Transfer Corporation, 17 Battery Place, New York, has placed a contract with **Ingersoll-Rand Company** for an 800-horsepower, direct-reversible, oil engine for installation in its new tugboat which is being built by the Spedden Shipbuilding Company.

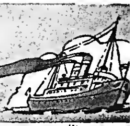
It will be remembered that the Oil Transfer Corporation already has a direct-reversible, Ingersoll-Rand oil engine in its motor tug Hustler.



This spirited photograph shows three cruisers built by the Grandy Boat Company of Seattle for fish patrol work in Alaska. These boats are developing a speed of 25 miles an hour. They are powered with 200-horsepower, 6-cylinder, Hall-Scott gasoline engines.



San Francisco Bay Shipping Directory



Simpson & Fisher
INCORPORATED

Sailmakers and Dealers in Cotton Duck

For Domestic and Export Trade

Selling Agents
Protectol Liquid Waterproofing

R. P. RASMUSSEN
MANAGER

240 Steuart Street
SAN FRANCISCO

ETS-HOKIN and GALVAN

MARINE ELECTRICIANS
RADIO ENGINEERS

Supplies, Repairs, Construction

181 STEUART STREET, SAN FRANCISCO
Phone: Davenport 1526

240 CANAL AVE., WILMINGTON, CAL.
Phone Wilmington 704

HAVISIDE COMPANY

SEAGOING STEEL WRECKING AND SALVAGE BARGES

Complete Salvage Equipment
Lifting Capacity up to 100 tons

SUBMARINE DIVING
SHIP CHANDLERS
SAIL MAKERS SHIP RIGGERS

Agents:
American Steel & Wire Co.
Stratford's Best Oakum
Fitler's Cordage
Alberton Cotton Duck

56 Steuart St. Tel. Davenport 3643
San Francisco

A. J. MORSE & SON, Inc.

DIVING APPARATUS
FIRE SUPPLIES AND THE INVINCIBLE NOZZLE

221 HIGH ST. Boston, Mass.

United States Rubber Company, San Francisco, Seattle, Tacoma, Portland, Spokane, Los Angeles

G. BRUCE NEWBY

NAVAL ARCHITECT - MARINE SURVEYOR

LOS ANGELES HARBOR
524 WEST SIXTH STREET
SAN PEDRO, CALIFORNIA
TELEPHONE 4517

PAGE BROTHERS

SHIP AND FREIGHT BROKERS

310 California Street, San Francisco

907 Dexter Horton Bldg., Seattle, Wash.
1114 Board of Trade Bldg., Portland, Oregon

Tel. Kearny 2907

D. W. DICKIE

ENGINEERS and NAVAL ARCHITECTS

SANTA MARINA BUILDING, 112 MARKET STREET
SAN FRANCISCO, CALIFORNIA

Telegraphic Address, "DICKIE," San Francisco

C. J. HENDRY CO.

27-31 MAIN STREET
Davenport 2800
San Francisco, Cal.

435 FRONT STREET
San Pedro, Cal.

SHIP CHANDLERY—Columbian Manila Rope, Engineers' Supplies, Woolsley's Copper Paint

FISHERIES' SUPPLIES—Linen Salmon Netting and Threads, Cotton Netting, Rope and Seine Twine, Fishing Boat Supplies

C. H. EVANS & CO.

Established 1875

MACHINE WORKS

Repairing—Pipe Cutting—Pumps
Evans' Steam Steering Gear

187 FREMONT STREET SAN FRANCISCO

J. & R. WILSON, Inc.

SHIP CHANDLERY and SHIP PROVISIONS

Lion Patent Asbestos and Semi-Metallic Packing

127-135 STEUART ST. SAN FRANCISCO

WELCH & COMPANY

SHIPPING AND COMMISSION MERCHANTS

MATSON BLDG., 215 MARKET ST., SAN FRANCISCO
Telephone Kearny 624-625

VEHISOTE
Trade Mark.

THE STANDARD PANEL BOARD

recognized by
ALL SHIPYARDS, NAVAL ARCHITECTS AND SHIP OWNERS

Samples and information gladly furnished on request.

PANTASOTE COMPANY, INC.
250 Park Avenue at 46th Street, New York
People's Gas Building, Chicago.
753 Monadnock Building, San Francisco, Calif.

WATERHOUSE-LESTER-SCOVEL CO.
540 Howard Street, San Francisco, Calif.

The Estate of

W. W. SWADLEY, *Photographer*

wishes to announce that the business formerly conducted by Mr Swadley at 268 Market Street is being carried on in conjunction with the business of

MORTON & CO., Commercial Photographers, 515 Market Street

All negatives made in the past by Mr. Swadley have been transferred to 515 Market Street and will be available under the same file numbers as previously and all correspondence regarding reprints or making new photographs should be addressed to 515 Market Street.

The telephone number remains the same: SUtter 2310

The estate also wishes to express appreciation to Mr. Swadley's friends and customers for their patronage and assure a continuation of high class service under the new arrangement.

Estate of W. W. SWADLEY.
Mrs. Marion Swadley,
Mrs. Marietta Knowlton, Executrix

Pacific Marine Review

The National Magazine of Shipping

NOVEMBER, 1929

Official Organ
PACIFIC AMERICAN

Official Organ
SHIPOWNERS' ASSOCIATION
OF THE PACIFIC COAST

Pacific Marine Review

VOLUME XXVI NOVEMBER, 1929 NUMBER 11

Recent Progress in the Safety of Stevedoring Operations

Pacific Coast Operators Lead the World in Cooperative Safety Work

By FRANK C. GREGORY*

Safety Engineer, U. S. Employees' Compensation Commission, Washington, D. C.

PROGRESS implies measurement, and to an engineer the term measurement is definite enough to require a "yardstick." To find a proper yardstick for the safety movement in the stevedoring industry and then to apply it to the industry from New York to New Orleans, on to Los Angeles and to Seattle, with the knowledge that the movement is new, is a challenge to any engineer. The things to be measured include such intangibles as altitude of the individuals who make up the industry, whether it be of resistance, passivity, or enthusiasm in regard to the safety movement. These have to be taken with the tangible and concrete evidence. A starting point and an objective are also needed if we are to get any results from our measurements. In preparing this paper the condition of safety work in August, 1928, is taken as the starting point; the year ending August, 1929, is the period considered for signs of progress; and the "measuring stick" set up here will be used as a standard for measuring the progress made.

The Measuring Stick

Organized accident prevention work, which is the conscious and sustained effort of an industry to reduce its accidents, has several phases through which it nominally passes before reaching the desired result—real accident prevention. The more important of these phases are taken as the units of the measuring stick of progress, which follows:

1. Challenging the interest of the industry:
2. Selling the idea to the management:
3. Organizing the work:
4. Doing the work:
5. Getting results:

Status One Year Ago

With these phases in mind, incidents of recent years, prior to August, 1928, will now be considered. Numerous things had happened in recent years to bring the seriousness of the injuries to longshoremen before the industry. Insurance rates had increased due to increased number of accidents and to the increase in the number and size of awards and settlements in personal injury cases. In July, 1927, longshoremen were brought under a federal compensation law, and it had been in operation for a little over a year. This law, probably more than any other one thing, brought the cost of the accidents forcibly to the attention of the industry and made it possible to accurately estimate the cost. The Marine Section of the National Safety Council and some individuals had kept the subject continually before the industry with suggestions for improvements. The adoption of national and port safety codes of other nations where our ships call had made necessary the altering of certain vessels to comply with these standards. The International Labor Office had adopted its first draft of stevedoring safety standards. So there is no doubt that the interest, and in some cases the alarm, of the industry was aroused at this time.

Definite progress in the work of organizing the industry for cooperative work had been made in a few ports. The Waterfront Employers of Seattle had been doing accident prevention work as an association since 1924; had a full time safety engineer on the job, and in March, 1928, had issued the first safety rule book of the country for cargo handling. The ship owners and the stevedores of San Francisco had combined their efforts in one Accident Prevention Department, working for the elimination of accidents both at sea and in port, on the ship and on the dock. This cooperative work had started in 1927, was well organized and already producing results. The safety engineer had a well developed program, including continuous contact with the association's members, the development of accident causation statistics, the holding of foremen's dinners and the development of a safety code. In the spring of 1928 the employers of the port of Los Angeles through the Marine Service Bureau started active work under the direction of the Accident Prevention Department at San Francisco and were getting their plans perfected by August. On the Great Lakes the Lake Carriers' Association has for several years been carrying on an active and successful attempt to reduce the accidents on board the vessels controlled by members of the association. Construction and upkeep of the vessels had been considered, and regular safety committee systems and safety instruction courses were in use. There were dock safety codes and dock safety committees at the head of the Lakes. This Marine Section was working actively on many lines, and advocating the development of a national marine safety code.

The tangible results secured in the way of reduced accident frequency cannot be estimated. Many companies had reported substantial reductions, some of them up to 50 per cent. of their former experience. There are no figures of national scope upon which to base a judgment. The organization work had proved sufficiently satisfactory so that its support was increased.

Progress of the Past Year

Using the same units of measure, the progress of the past year will now be examined. With the interest of the

*Abstract of an address before the Marine Section, National Safety Council, at Chicago, October 3, 1929.

Edward T. Ford

As Vice-President in charge of Pacific Coast affairs of W. R. Grace and Company, President of the Panama Mail Line, President of the Arrow Oil Company, and President of the Shipowners and Merchants Tugboat Company, E. T. Ford is one of the busiest as well as the most popular of the Pacific American steamship operators. In his leisure hours he enjoys golf.

entire industry aroused, a minority already actively engaged in the work and still others "half-sold," there was a good chance for progress.

Based upon visits to most of the larger ports, and upon the developments in general, the writer is of the opinion that the attitude of the industry to organize accident prevention work is considerably more favorable than it was a year ago.

This is based upon the reaction of groups and individuals at different times during the period and upon the increase in activities. If this opinion is correct, it represents one of the important phases of the progress.

The subjects which have received the greatest attention of the industry during this period are development of safety codes, organized accident prevention work, legislation, and classification of accidents.

Safe Working Codes

The work upon the safety codes has been the most wide spread and has probably been the most important of these, since it has been responsible for so much serious consideration of the entire field of accidents to longshoremen in all of its ramifications. It has brought all parties at interest together for discussion and has resulted in the formation of several port and district codes which are being used as standards.

Radiobeacons to Guide Ships to the Panama Canal

HEREAFTER ships 100 or even 200 miles from the Panama Canal may take accurate bearings each half hour to guide them to the canal entrances. The Lighthouse Service of the United States Department of Commerce has given notice to mariners that a radiobeacon is now in operation on each side. The radiobeacon at Cristobal at the Atlantic entrance was put in service on July 20, and the signal at Cape Mala, in the Pacific approach, commenced operating on Sept. 11.

These are the first radio-beacons in the western hemisphere south of the United States coasts. They form a most important extension of the fairly complete system which has been developed along the Atlantic, Gulf, and Pacific Coasts of the United States in the last few years and which is now being extensively used by ships equipped with radio-compasses for guidance not only in fog but in clear weather. Some additional signals between our coasts and Panama, both in Central American waters and on the Pacific side, would be very helpful, and are being asked for by navigators.

An important departure is being made in the operation of these radio-beacons. Each will send signals continuously for a period of 10 minutes out of each half hour, regardless of weather conditions. Thus Cristobal will send signals for the first 10 minutes of each half hour, and the two sending periods for Cape Mala will commence at the 15th and 45th minute of the hour. Thus the two signals will not overlap as to time. They are also otherwise clearly distinguished, as Cristobal sends single dashes continuously on a frequency of 305 kilocycles; while Cape Mala transmits continuously groups of two dashes on a frequency of 295 kilocycles.

These radio-beacons are operated automatically by clock control devices and are under charge of the nearby Navy radio stations, from which they are regularly inspected.

The installations were made by radio engineers of the United States Lighthouse Service with standard equipment of that Service and with the cooperation of the Panama Canal authorities.

Windjammer Crews

THE crew of the average windjammer of forty years ago were a polyglot lot of roughnecks, gathered up from shady boarding-houses when they had spent their last dollar and shoveled aboard like so much unconsidered garbage. Mostly they were strangers to one another. They had no inherited loyalty to any particular ship or service; all were alike to them in being workhouses where starvation was flaunted at the masthead.

They signed on—or were signed on for—for a period of three years, and there was not a single amelioration to which they might look forward. In foreign ports they worked from dawn to dark and often beyond; at sea they never were permitted to forget their work. When Saturday night came around in harbor they were maybe grudgingly given a dollar of their pay and permitted to go ashore and get drunk. The only thing they knew about the countries they visited was the location of the drink dens and the quality of the liquor available!

Unpromising material. Within thirty hours of a windjammer dropping her pilot these score of gutter-sweepings, Paddy Westers, no-goods, were a fighting brotherhood, perfectly ready to strain heart and nerve and sinew for the welfare of the ship that was their comfortless home, until there was nothing left in them beyond the will that bade them hold on against impossibilities. I have seen them, and I know. I don't know what bred the discipline that locked them together; it was either a common fear or the personal magnetism of the officers set over them; but some quality did so bind them.

They were ready to work fifty hours at a stretch without food or rest; without a corner wherein to dry out their sodden garments; they were content to sleep at opportunity on sodden straw mattresses between more sodden blankets; to turn out—stiffened with rheumatism—into boisterous water bellowing over the bulwarks in devasting torrents submerging them to their shoulders—ice water at that, water that froze where it fell for the most part—and to scramble aloft and fight for unimaginable hours on jolting yards, with the big winds striving to tear the armor-clad canvas from their bleeding grips. And they also were ready to go below and slave with shovel and fork to right a shifted cargo when the craft was lying in deadly peril on her beamends; to fight fire as well as storm; to believe wholeheartedly in the ship herself and those in charge of her; and never, never to shirk a duty no matter how unreasonable or arduous it might appear.

There are few like these stalwarts today, alas! They worked for sheer love and lust of turning out a workmanlike job. I have seen them hundreds of times, refusing to go below at eight bells simply because the particular task demanding their attention was not completed; and they preferred to do it themselves rather than intrust it to another. They also took us youngsters under their competent wings and instilled into us rare learning, wisdom unpurchasable—the wisdom of their checkered experiences—and looked after us much as our mothers had done in our earlier youth.

[From "The Men Who Fought," by Captain Frank N. Shaw in the New York Herald-Tribune.]

Steamship Pennsylvania

Largest American Merchantman and Third Electric Liner for Panama-Pacific Fleet Completed by Newport News

THE 33,375-ton turbo-electric liner Pennsylvania of the Panama Pacific Line, the largest merchantman ever built in America, arrives at San Francisco Monday, November 4. She is not alone America's greatest steamship, but the world's biggest commercial vessel propelled by turbo-electric drive. At the time of her launching July 10 it was predicted that she would enter the merchant service as the foremost liner flying the American flag and the prophesy has been fulfilled.

Under the critical observation of maritime and shipbuilding experts, the Pennsylvania was put through an exacting test on her 12-hour sea trial off the Virginia Capes, October 3, surpassing in every detail the rigid performance requirements planned for her.

A corner of the first-class lounge featuring Kearfott windows.

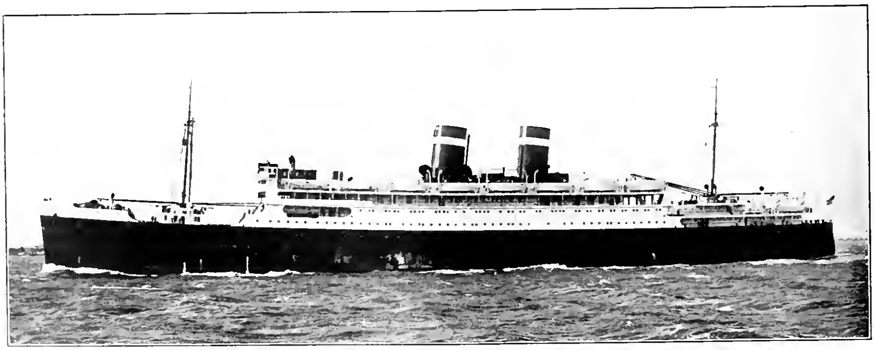
A significant fact in connection with the date of this sea trial is the remarkably short time of construction, which constitutes a world's record for a vessel of this size and character. The construction contract was signed July 5, 1928, and required the vessel to be delivered to the owner March 1, 1930. The first keel plate was laid October 15, 1928, the launching took place July 10, 1929, the sea trial was held October 3, 1929, and the vessel was delivered October 12, 1929. Thus it will be seen that the time from keel laying to delivery is three days less than one year. This is a very notable achievement and the Newport News Shipbuilding and Dry Dock Company is to be congratulated on this splendid showing.

The new Pennsylvania is 613 feet long, has a beam of 80 feet, a displacement of 33,375 tons, and a depth of 100 feet from upper deck to keel. In her luxuriously furnished staterooms, all outside rooms, she has accommodations for 800 passengers, equally divided between first and tourist cabins; while her enormous cargo holds will have a maximum capacity for 10,000 tons of perishable and semi-perishable cargo. At an average speed of 18 knots the great liner, without being pushed, will make the 5000-mile journey from coast to coast in 13 days.

Designed for trade developed in recent years under the American flag, fabricated in a famous American shipyard, and powered with the latest type of American-built electric machinery, the Pennsylvania completes a trio of the most striking vessels yet created for the American mercantile marine.

An Electric Trio

The three ships have been built to meet certain definite requirements of the route on which they operate. They are designed to convey passengers in comfort through both tropical and temperate climates. They are



The steamship Pennsylvania running 18.9 knots on her trials.

luxuriously equipped in both first and tourist cabins, the latter equaling former first-class standards, and they have exceptionally large refrigerated and cool-air space for the conveyance of fruits and other perishable cargo, now being shipped in large quantities from California ranches for eastern markets.

The inheritance of the Pennsylvania comes from a steamship line foremost in the annals of American shipping and her appearance upon the sea symbolizes an encouraging rejuvenation of the American merchant marine. She is named after the famous American liner Pennsylvania, flagship of the original American Steamship Company of Philadelphia.

Pennsylvania Traditions

Before the Pennsylvania's keel was laid, P. A. S. Franklin, president of the International Mercantile Marine Company, informed the naval architects that he desired the decoration of the vessel's public rooms to be commemorative of the history of the state of Pennsylvania; and the suggestion has been accurately and artistically carried out by Barnet Phillips Company, prominent New York decorators, and J. Philip Kiesecker, associate, ably assisted by Cox, Nostrand and Gunnison, illuminating engineers of New York, who designed the lighting fixtures to harmonize with this general decorative scheme. The observant traveler on the 13 day run from coast to coast will have ample opportunity to refresh his memory on the colonial history of the Keystone State, merely by casual observation of the portraiture, murals, pictorial charts, and furnishings of the new liner.

Pennsylvanians who figure in early American history look down from walls fashioned in the rich simplicity of old Philadelphia drawing rooms or the honestly rugged panellings of colonial country homes. Canvases depict scenes in Pennsylvania history, from Penn's treaty with the Indians to Washington's winter at Valley Forge. Some of these paintings are faithful copies in oil by Mrs. Carola Spaeth of well known paintings in the Pennsylvania Museum and some are

After end of lounge, showing stage.

The spacious lobby to the first-class lounge, featuring Goodyear rubber flooring.

originals by Charles V. John, another noted Philadelphia artist. Several murals by New York artists also follow this Pennsylvania motif.

In this decorative plan, so expressive of early American life, has been woven with skill certain pictorial reminders of the glamorous days of Spanish discovery in the Caribbean, which the ship will traverse on her regular route to and from the Pacific Coast.

The style of the old time cartographers has been invoked in the production of a large map, done by Stuart Travis of New York, that is mounted on the forward bulkhead of the dining-room foyer. Showing the United States and its adjacent seas, the Caribbean and the Coast to Coast route, the map contains vignettes on transportation by way of Panama and also certain hints of the Forty-niners.

In the smoking room is a similar map by Mr. Travis showing the cruising world of the buccaneers in the West Indies, and giving portraits of some of the free-roving brotherhood, with their records.

Equipped for Outdoor Life

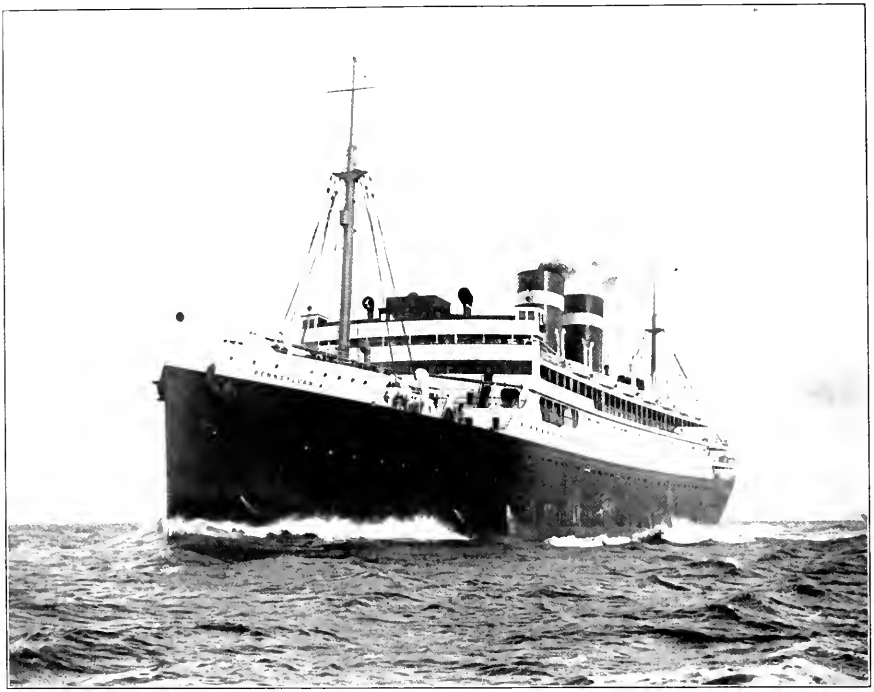
Following the plan introduced on the first of the electric liners, the Pennsylvania has been given extra wide decks for promenading and sports, and has been fitted with capacious built-in deck swimming pools both fore and aft, a popular feature on these ships that cruise through the sunshine belt of the tropics.

Public rooms have been designed to make the most of fresh air and sunshine, for they are lofty and have large windows that open outward, casement fashion. As in the monster Atlantic liners of recent build, the first-class public rooms are all on the promenade deck and in the electric ships have a standardized arrangement.

Public Rooms

In size and arrangement the Pennsylvania's public rooms are identical with those of the Virginia, differing only in color-tones of walls and furnishings and in special features pertaining to the respective histories of the two states.

Forward is the library, a wide room with a row of windows looking forward. Its decorations present a warm and opulent color effect in gold and delicate green suggesting sunshine and summer freshness. Wood-panelled walls are painted in neutral shades. The light fabric curtains are fawn and gold, and the carpet of figured purple and old gold, the latter tone predominating in coverings and hangings relieved with tans and green. Ebony chairs are covered in jade brocade



The New Queen of the Inter-Coastal Service

Principal Characteristics.

Length, over-all	613 feet
Beam, molded	80 feet
Depth, molded	50 feet
Depth, top deck to keel	100 feet
Passenger accommodations:	
First class	400
Tourist	400
Seating capacity first-class dining room	350
Freight capacity, total tons	10,000
Cold storage capacity:	
Cooled air, cubic feet	60,000
Frozen " "	40,000
Displacement, tons	33,375
Shaft horsepower	17,000
Sea speed, knots	18
Capacity of fuel, tons	5,349
Cruising radius, miles	16,000

with small designs of flowers; sofas in jade silk damask; easy chairs in plum velvet; and a few armchairs in French brocade of old ivory with small floral designs in color.

In the mid-section is the lounge, the largest of the public rooms, a handsome apartment with a stage. French style in decorations and furniture, which appealed to the prosperous merchants of colonial days, is meticuously followed.

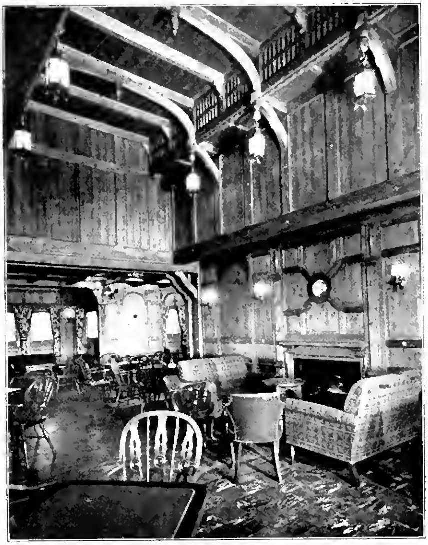
The room is of impressive proportions, nearly 50 feet square, rich and restful and free of pillars or other obstruction to interfere with a long vista in any direction. It is here that most of the passengers congregate in the evening for dancing, concerts, and other organized social activities so plentiful on the coast to coast route.

Lounge is Classical French

Its general style is classical French with attendant delicacy of design of cornices, panels, and mouldings. The ceiling which centers in a large glass dome with concealed lights is 13 feet above the floor. Large casement windows, designed and built by the Kearfott Engineering Company of New York, tend to emphasize the spaciousness of the room. The walls are of oyster-white, glazed with another tone to soften it. At the after end is the stage with a curtain of gold damask matching the hangings of the casement windows.

The furniture reflects the French influence without following any distinct period. The floor is covered by five large rugs, patterned after the old Aubusson carpets, with a tan background and roses of tan and red and leaves of bluish green. The sofas are blue jade in color, the wall chairs of silk damask in a copper tone, while green taffeta with satin stripe in copper, serves as covering for the side chairs. Other chairs are of silk velvet in faun, greens, and tans in small overlay pattern. French tapestry with seal background and leaves and flowers in coral and light blue is used for the coverings of the armchairs.

The largest painting on the Pennsylvania is the exquisite mural on the forward bulkhead of the lounge, called "Penn's Treaty with the Indians." It is a canvas about 10 by 12 feet by Aldo Lazzarini, a young painter of New York, and was inspired by the famous mural of Edwin Austin Abbey in the state capitol of Pennsylvania at Harrisburg.



The smoking room in old pine, paneled, is a very cozy nook.

Much of the beautiful colonial simplicity of the decorative treatment in the public rooms and in the corridors and staterooms of the Pennsylvania is due to the lavish use of Vehisote for panelling. The adaptability of this excellent material is a recognized asset to the wise interior decorator.

The Smoking Room

The Pennsylvania's smoking room which conjures up dim visions of periwigs, pewter, and churchwarden

In the veranda cafe which is the aftermost of the first-class rooms on the promenade deck, the decorators have achieved the illusion of a cool and airy summer garden. Delicately tinted walls, furniture in gold and black, upholstery in purple, green, and tan, large casement windows with figured linen drapes, and broad glass sliding doors all combine to make this an ideal lounging place and a sheltered continuation of the broad promenade deck. This room is immediately aft of, and it makes a very pleasing contrast with, the smoking room with its old pine paneling and subdued lighting effects.

Goodyear rubber flooring in pleasing colored-tile pattern aids the decorative effect in these two rooms. Over 30,000 square feet of this material is used on the Pennsylvania.

pipes, is panelled in old pine, after the manner of Colonial farmhouse interiors. Lighting fixtures are in hammered brass and iron. Under the pirate map there is a ripe old oaken sideboard nearly black. The floors are rubber tiled in large squares of warm coloring. These rooms in both cabin and tourist class are duplicates of those on the California and Virginia. The popular appeal and high commendation elicited by these attractive apartments when the California came into service convinced the naval architect and decorators that this style was worth preserving in the third liner.

Veranda Cafe Cool and Airy

In the veranda cafe, beyond the smoking room toward the stern, the designer has created the illusion of a cool and airy summer garden. Delicately tinted walls with frescoes in color in the pilasters and panels make a background for furniture of gold and black bentwood with seats upholstered in tapestry in purple, green, and tan. It is a particularly attractive apartment for lounging, for its casement windows and doors afford an unobstructed view of the sea. The lighting is soft and cool in tone, the major part of it coming from star lanterns of translucent English glass in the ceiling. The side brackets are of etched cut glass. Figured linen, with Nile green background and garlands of purple, yellow, and several shades of green, drapes the casement windows. Broad glass doors in iron frames, roll away in the walls of this room, giving wide openings upon a spacious deck devoted to sports by day and dancing at night.

A Unique Playroom

The Pennsylvania's playroom is a novelty. Nothing quite like it has been offered in interior decoration aboard ship. It is designed to be the reverse of most playrooms, in the principle of decoration. Each wall represents an outdoor scene, including a street scene, a diminutive house, and landscapes peopled with popular fairytale heroes and heroines.

This attractive apartment for children is on the boat deck, aft. The after wall shows the exterior of a brick and plaster house with three windows equipped with curtains and shutters. At the left is an entrance door which is actually an exit to the deck. Figures of mice, dressed as humans, are painted along the wall base, with lively cats and kittens ready to pounce upon them.

On the forward bulkhead is a rural scene with a house, a winding road, a windmill, a balky donkey, a cow upright, dancing with a milkmaid, and a party of pigs sitting at table.

On the port side are two adjacent doors leading into a make-believe house. From the corner projects a street lamp under which struts a Carbineri (Italian policeman) five feet tall. He is the mechanical cop, in full uniform, that guards the playroom and amuses the kiddies. He is operated by a concealed motor and is forever blinking his eyes, turning his head, and flicking his moustachios.

Dining Saloon

The dining saloon, reached from the upper decks by broad stairways or fast electric elevators, has a seating capacity for 350 people. It is decorated in consonance with the ship in colonial style, its walls and pillars painted in old ivory. In the central dome, bronze railed balconies and mirrors create an impression of distance. The chairs are upholstered in henna colored fabric. The floors are inlaid red and mottled squares of rubber tiling of Goodyear manufacture.

Foyers and staircases throughout the ship are panelled in snuff brown oak. Corridor floors and stair treads are covered with Goodyear glazed rubber tile.

All Outside Cabins

The spacious staterooms of the Pennsylvania were specially designed for the comfort and privacy of her passengers. Every stateroom is an outside room. Some have connecting sitting rooms and private deck space or veranda. Suites of this type are constantly in demand aboard the Virginia. There are numerous private baths, and for the first time on any ship a feature is made of "bathettes," equipped with an original, patented type of "sit-down" shower. Of these there are twenty-three.

In the furnishings of bed rooms care has been taken to avoid the use of heavy fabrics for upholstery or hangings. Simmons beds, Simmons springs, and Simmons Beauty Rest mattresses insure sleeping comfort. Heat, when necessary or desired, is obtained through Edison Electric Appliance Company "Hot Point" surface mounted wall type electric heaters. This heater is demountable by lifting it off its wall clips. The steward serves the state room with this heater as desired. Each room is equipped with electric fan, thermos bottle, ample lighting fixtures, electric outlets for curling irons, etc., and, of course, running hot and cold water.

Tourist Accommodations

Tourist cabin accommodation, while standard with that on the other two electric liners, has received in the Pennsylvania, the same careful attention as first class in carrying out a harmonious plan of decoration. The Colonial style here prevails also, and decorations, fabrics, and floor coverings are hardly less beautiful than in first class.

There is a lounge 42 by 42 feet, panelled in old ivory with hangings in warm tints; a dining saloon 73 by 38 feet that would have made the reputation of any liner of a few years back; a smoking room 46 by 29 feet, panelled in old pine, in the same style as the first-class smoking room; and on deck a capacious built-in swimming pool. Floor coverings here also are art tiles of rubber, and electric fixtures are of special design in brass or old silver.

In tourist cabin every stateroom has a bed, taking the place of a lower berth, and used in combination with bed-berths, in two-berth and four-berth rooms. Spring mattresses of good quality, rugs, hot and cold running water at a fixed porcelain bowl, electric lights, an electric fan and a capacious clothes closet in each room complete bed room comforts.

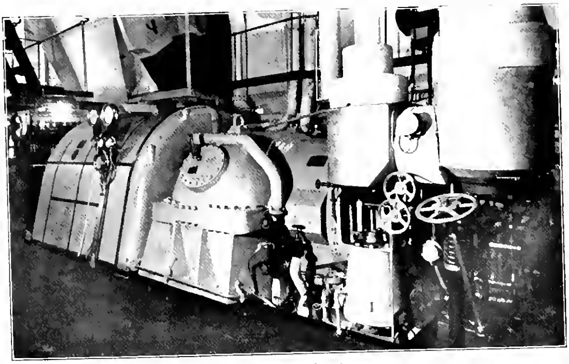
Pennsylvania's Electrical Power Plant

By Frank V. Smith,
Federal & Marine Dept., General Electric Co.

THE steamship Pennsylvania, third of a trio of all-electric vessels for the Panama-Pacific Line of the International Mercantile Marine Company, was launched at the yards of the Newport News Shipbuilding & Dry Dock Co. July 10 and sailed from New York October 19 on her maiden voyage to San Francisco.

The completion of this third vessel marks the passing of but a primary goal in a much more extensive shipbuilding program for the future. In an address following the launching of the Pennsylvania, P. A. S. Franklin, president of the International Mercantile Marine Company, stated quite forcibly that the ultimate goal for the Panama Pacific Line is a fleet of six vessels, thereby giving a weekly service between New York and California, instead of the present fortnightly service.

The building of the three liners, California, Virginia, and Pennsylvania, launched in the order named and all commissioned into service within the short period of one year and nine months, stands out as one of the most courageous and progressive shipbuilding programs ever undertaken by a private shipping company under the American flag.



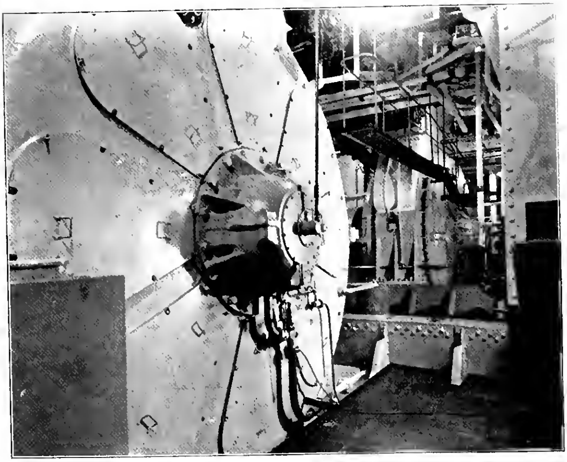
One of the main turbo-electric generators.

In addition to these vessels being the largest passenger liners ever built in America, they also hold the distinction of being the first large merchant craft to be completely electrified.

The three vessels exemplify in the highest degree America's leadership in electrical marine engineering application and mark a distinct epoch in our maritime history. They have created new standards of efficiency and luxurious comfort in keeping with the new era we enjoy on land. The world-wide interest that they have created and the number of new vessels that are adopting the advanced engineering methods which they established show that the new era is rapidly supplanting the old.

The Pennsylvania, the newest of the three, is the third brilliant achievement in a preconceived plan to cement the East and West coasts of America with ample and modern transportation. From an engineering point of view the three vessels are close enough in their main characteristics to be rightfully classed as sister vessels. The California, first to be launched, has a length of 601 feet and passenger accommodations for 750; the Virginia and Pennsylvania are 613 feet long and have passenger accommodations for 800.

The Virginia and Pennsylvania, identical in their engineering, incorporated but few changes over that of the California. To the engineering economist, such changes as were made are of interest. To the traveler they do not show by outward appearance a difference that can be visualized. The performance, smoothness of operation, speed and power are the same. The wide promenade decks, the facilities for sports, the gayety, the cuisine, the freedom from vibration, the elimination of noise, the con-



View across forward end of propulsion motors.

tentment that comes on a voyage through tropical seas — in all of these things the three vessels share alike.

The all-electric fleet of the Panama-Pacific Line stands as a symbol of the scientific attitude of our people. They denote modernity in its most complete sense. They have created increased interest in sea travel between our two coasts. To study the completeness of their electrification is to get an insight into the trend of the future. To visualize the powering equipment is to see the fruits of electrical research concretely applied.

Steam Generating Equipment

On each vessel steam is generated by eight of the new interdeck marine type Babcock & Wilcox boilers with incorporated superheater. These boilers supply steam at 300 pounds gauge pressure and with a superheat of 200 degrees Fahrenheit. The boilers are served with force draft by motor driven multivane type Sturtevant blowers. Diamond soot blowers are incorporated in the boiler set-up. Two 3-stage centrifugal 5-inch Worthington pumps, with a capacity of 600 gallons a minute at 425 pounds per square inch pressure, supply the boilers with feed water. These pumps are driven by Sturtevant steam turbines.

Davis paracoil heaters raise the feed water in two stages from 100 degrees to about 230 degrees Fahrenheit. Three Davis Paracoil 50-ton evaporators and two Davis Paracoil distillers with a capacity of 10,000 gallons insure make-up feed water and fresh water for culinary purposes.

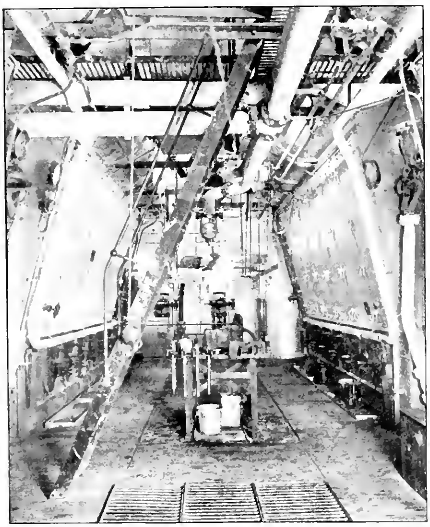
Main Propulsion Equipment

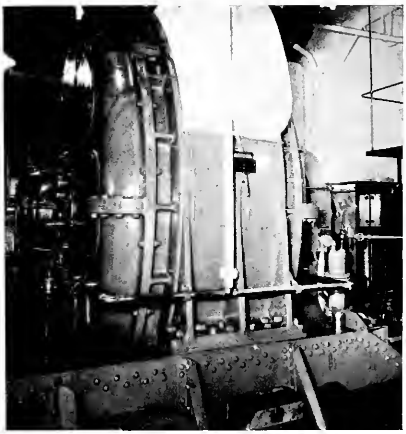
On each vessel there are two main turbine generators supplying power to two propulsion motors which are each connected to their respective propeller shafts. Each generating unit is rated 6600 kilowatts, 4000 volts, 2880 revolutions per minute, and normally furnishes power to an individual propulsion motor. The main power circuits are arranged, however, for parallel operation of the two propulsion motors from either main generator when operating the ship at 75 per cent of maximum speed or less.

Unlike prime movers which are mechanically coupled to the propeller shaft and which of necessity must be brought to a complete stop to stop the propeller, or reversed to reverse the propeller, turbine electrically propelled ships make use of a unidirectional, constantly rotative prime mover. Power is produced on the line when the generator field is energized and off when the excitation circuit to the generator is opened. Three main current-carrying cables connect the generator to the motor. Two of these cables are so arranged by cross-over connections that their juxtaposition can be altered. In reversing the direction of rotation of the propelling motor it is only necessary to alter the position of these two cables, which is accomplished by means of a reversing lever situated on the control panel.

In maneuvering the vessel from ahead to astern the field lever (which opens the field circuit and shuts off the power) is moved to its "off" position, the reversing lever is moved to its "reverse" position, and the field lever is again moved to the "run" position. The field and reverse levers are mechanically interlocked so that they can be operated only in the right sequence. The ease and rapidity with which the functions can be accomplished are rapid enough to satisfy the most urgent emergency requirements.

The propelling motors are of the synchronous-induction type and rated 8500 shaft horsepower at 120 revolutions per minute. The induction motor winding, which is of the squirrel-cage type and which is im-





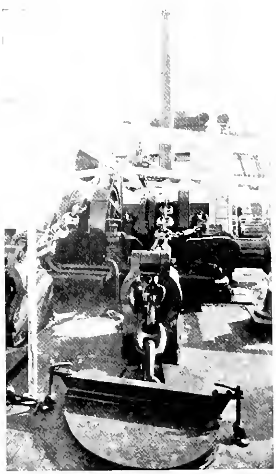
Boiler room, left, and above, close-up of main propulsion motor.

bedded in the pole faces of the rotor, is used only in starting. As soon as the motor reaches its slip speed as an induction motor, excitation is applied to the rotor field windings and the motor is synchronized.

The thrust of each propeller shaft is taken on a bearing of the Kingsbury type having a single collar 41½ inches diameter forged on the shaft. The savings in space and weight due to the use of the Kingsbury type bearing as compared with the old multiple collar thrust bearing are very obvious in any installation. With a large vessel, such as the Pennsylvania, the chief benefit results from careful attention to lubrication. The wedge-shaped oil films maintained by the pivoted shoes of the Kingsbury thrust bearing practically eliminate friction; and in comparison with the old style bearings this elimination of friction on the Pennslyvania amounts to over 100 horsepower.

The control panel on the three ships is similar. In addition to the field and reverse levers referred to, there is a turbine speed control and a controlling rheostat for both the generator and the motor field. With the latter, the excitation can be either increased or decreased to give the desired voltage.

The other instruments and gauges on the panel are for purposes of information valuable to the engineer in the efficient operation of his plant. They consist essentially of ammeters, voltmeters, and wattmeters for the main power circuits; ammeters in the field circuits; excitation indicator which indicates the reserve combined torque characteristics of the generator and motor considered as an electric unit; revolution indicators and counters; test receptacles for determining the temperatures existing in the generator and motor stators; generator field temperature gauge; ammeters in the motor ventilating fan circuits; and pressure and vacuum gauges.



Hyde steam windlass and Naco anchor chain.

The control panel is divided into a port and starboard section and the instruments on each panel are duplicates.

In case two propelling motors are operated from one generator, the generator readings are taken from the side in use and the motor readings from their respective panels.

The generators on both the Virginia and Pennsylvania have a totally enclosed, water-cooled system of ventilation similar to that found in the latest power house installations. The possibility of any sediment being deposited on the windings is, therefore, entirely eliminated. At full power rating of the generators and motors the temperatures in practice have been found to be below those permitted by the rulings of the classification societies, which shows that the equipment is very conservatively designed.

The propelling equipment obviously has the same power available for backing as for going ahead which gives a very rapid maneuverability. The turbine is contained in one casing and being free of any backing element is reduced to the most basic design characteristic. The turbine rotor is of solid construction; that is, the wheels and shaft are milled from a single forging. Three hand valves are provided which give seven different nozzle group combinations for the elimination of throttling losses.

The turbine generators are situated on an upper platform directly above the condensers; they are, therefore, self-draining, and exhaust pipe losses are eliminated.

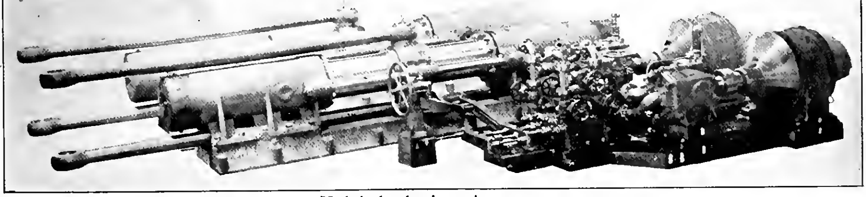
Auxiliary Generating Equipment

The auxiliary electric plant consists of four 500-kilowatt direct-current turbine generators. They are situated on an upper platform deck directly above their condensing plants. There are two auxiliary condensers, each of which receives the exhaust steam from two of the auxiliary sets.

Under normal operating conditions at sea, two units are usually operated; one on the excitation bus and one on the auxiliary power bus. A number of auxiliaries are provided with double-throw switches so that they can receive their power from either bus in order to even up the load on the two units. If desired, two or more generating units may be paralleled on the power bus.

The generators are of the three-wire type when used on the excitation bus, giving either 120 or 240 volts. When thrown on the power bus they operate as 240-volt machines only, balancer sets being provided for the 120-volt lighting circuits.

The units are of the geared type, the turbines operating at 5000 r. p. m. and the generators at 1200.



Hyde hydro-electric steering gear.

Below-Deck Auxiliary Electric Motors

The electrified auxiliary equipment in the engine and fire rooms consists of the main circulating and condensate pumps; the auxiliary circulating and condensate pumps; the forced draft blowers; sanitary pumps; oil cooler circulating pumps; ice water circulating pumps; and motor ventilating fans.

The main circulating pump motors, of which there are four, are each rated 100 horsepower and provided with field control to give any speed desired between 325 and 600 revolutions. The starting equipment is of the magnetic type and the motors are started or stopped by means of a small switch. Each main condenser is provided with two circulating pumps and they can be operated singly or in parallel as desired.

The condensate pump motors of which there are three are each rated 7½ horsepower at 1200 revolutions per minute. One pump on each condenser is normally operated, the third acting as a standby with crossover connection to either condenser.

The auxiliary condenser circulating pump motors are each rated 30 horsepower and are provided with field control for varying the revolutions between 675 and 900. Three auxiliary condensate pumps are provided, one to act as a standby.

The forced draft blower motors are each rated 24 horsepower and may be varied in speed from 310 to 575 revolutions. The sanitary pumps are each rated 20 horsepower, 1500 to 1750 revolutions per minute, the oil cooler circulating pump motors are rated 7½ horsepower, 875 to 1750 revolutions per minute; and the ice water circulating pump motors, 3 horsepower 1750 revolutions per minute.

All of the electrically driven centrifugal pumps noted above were furnished by the Warren Steam Pump Company.

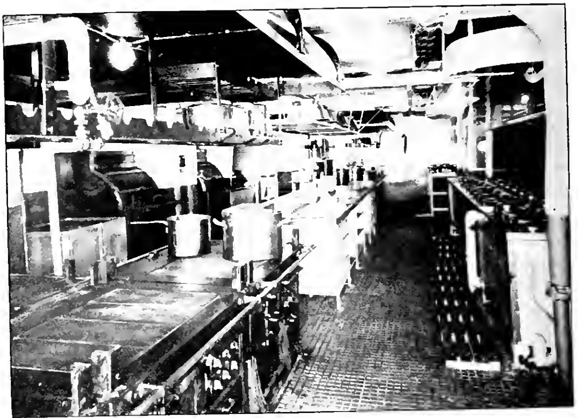
The electrification of the ship's auxiliaries outside the engine and fire rooms is most complete, and neither pains nor expense have been spared in its generous application where safety, comfort, sanitation, and elimination of manual work could be advanced.

Navigational Equipment

The navigational department has installed the latest types of scientific apparatus for the accurate determination of position, sensitive and accurate steering, and means for safeguarding the vessel.

The equipment consists of a complete Sperry gyroscopic system with master and repeater compasses; a Hyde 4-ram type hydro-electric steering gear which may be operated with Sperry gyro automatic helmsman or manually, as desired; a Radio Corporation of America radio compass and direction finder; Sperry searchlights and Sperry electric rudder indicator.

The boiler rooms of the Pennsylvania are protected against fire by the Foamite system. The Rich smoke detection system is provided in the cargo holds and in other inaccessible places. The control cabinet is located in the pilot house. A steam smothering system is provided for extinguishing fires in the hold. The Derby fire alarm system is used to give indication of fire danger in staterooms and public rooms of passenger accommodations. An elaborate system of electrically operated water-tight doors is controlled instantaneously from the bridge in case of emergency.



First class galley.

Ventilating System

The ship's ventilating system is elaborate and designed to bring comfort in the tropics. The toilets, baths, smoking rooms, and galley operate on an exhaust system. The staterooms, public spaces, crew's quarters, engine room, and refrigerating spaces operate on a supply system. There are in all a total of 27 motor-driven fans for ship's ventilation with a total capacity of above 250,000 cubic feet of air per minute.

The ventilating fans for the ship's cargo spaces, engine room, and public rooms are of the Sturtevant multi-vane type.

Refrigeration Machinery

The largest single user of electricity outside the engine room is the extensive refrigerating equipment. The cold storage space has a volume of 100,000 cubic feet. Sixty thousand cubic feet of cool air space is provided for the carriage of fresh fruits or other products in which absolute freezing is not essential; 40,000 cubic feet of space is provided for frozen cargoes.

The refrigerating machinery, completely electrified, consists of four 100-horsepower compressors, three 16-horsepower brine circulators, one 5-horsepower brine circulator, and two 15-horsepower refrigerator condenser circulating pumps.

Brunswick-Kroeschell Company supplied the refrigerating machinery.

Galley Equipment

The galley and pantries are electrified throughout. The equipment consists of ranges, bake ovens, electric griddles, toasters, hot plates, automatic electric dumb-waiters, dishwashers, and small electric appliances of various kinds.

Ranges, bake ovens, and all principal electrical equipment in galleys and pantries were supplied by the Edison Electric Appliance Company.

(Continued on Page 35, Blue Section)

Statistics in Maritime Accident Prevention

By ARTHUR M. TODE,
Marine Superintendent, Technical Division,
The Texas Company*

RECORDS and statistics in any business must justify their existence; they must compensate for the expenditure of time and effort which their preparation demand by unquestionable, reliable data from which can be gleaned the errors of the past to correct the mistakes of the future. The maritime world has adopted many standard practices of commercial industries ashore. There is, however, one phase of modern business in which the shipping executives on the whole still lag behind; this subject, that of accident prevention work is, nevertheless, receiving increased attention from shipowners and operators as its great importance is heing realized.

Depending upon the trade and services of its ships, the type and number of sea-going vessels and harbor craft employed, and the passengers or cargoes transported, the location of its terminals, loading and unloading practices, and numerous other factors, a large shipping company interested in the safety of its passengers, crews, cargoes, and vessels delegates to one of its executives the proper and sane conduct of safety work. The authority for such work should not be divided; it should rest solely and squarely on the shoulders of someone who should be held responsible for the work by the management.

It is assumed that a concern engaged in safety work of any kind, sufficiently interested in the promotion of safety to engage actively in accident prevention work, will have a natural desire to know if its efforts are successful. A great awakening is taking place in the marine industry. Employers are beginning to realize as never before that accident occurrence means economic loss as well as unnecessary suffering from personal injuries. They are gradually becoming convinced that there is a very definite relation between accident control and elimination of unnecessary operating costs; and the probable extension of the principle of workmen's compensation to all maritime occupations has pointed out to them the urgent necessity of assembling dependable statistics on the frequency and severity of accidents in their industry.

The marine department of The Texas Company, after the inauguration of an accident prevention campaign several years ago, realized the necessity for compiling workable statistics which would be concise, yet readily show the complete trend of accidents occurring on board its vessels, not only for its own benefit but also to assist the insurance department and the employment and service department. The primary purpose in the compilation of personnel accident statistics covering The Texas Company vessels was to reveal conditions which might result in injury to the crews, so that remedial measures, if possible, could be applied. For practical reasons it was usually found necessary to restrict injuries to conditions which had actually caused a "lost time" personal injury and to omit those which had not resulted in this type of accident.

All accidents and injuries of any kind to the personnel on board ships of The Texas Company, no matter how trivial or insignificant they may appear at the time, as well as all cases of illness where medical treatment is prescribed, are reported by the masters of the respective vessels on a form "Report of Personal Injury or Illness" as shown.

The insistence by any company that a similar report be completely and conscientiously filled out by the master for every injury or illness is absolutely necessary. Inaccurate or incomplete data are worse than no data—the importance of this information properly recorded for study and use of the several departments of a company cannot be too greatly stressed.

There are two major factors comprising the measurement of accidents by causes. They are, namely:

(1) **Frequency**—which is the number of accidents attributed to a certain cause.

(2) **Severity**— which is the "lost time" attributed to the cause.

It is usual for large companies on shore engaged in safety work and the compilation of its statistics to consider an "Exposure" factor in the form of total hours worked, in addition to the "Frequency" factor and the "Severity" factor explained above. Some safety engineers engaged in shore practice contend the exposure factor is most important, and probably this is true in certain shore operations, manufacturing, etc. It is claimed by these safety engineers that it is not sufficient to know how many accidents occurred during a given period of time or to learn how much lost time was occasioned by the accidents. It is further contended that comparisons of periodical records of the number of accidents and the amount of lost time are practically useless unless the number of accidents and the amount of lost time are related to the exposure of the employees to hazards and dangers presented by the work. A careful study of the "Exposure" factor by executives engaged in marine accident work has made it apparent that it would be impossible to obtain and tabulate with a fair degree of accuracy the data required in this respect, and, also, that the amount of time and effort required to obtain this information would be out of all proportion to its benefits. It would be a case, as far as the marine industry is concerned, where statistics would not justify their existence.

In shore safety work it is usual to consider the "lost time" under a caption of "Man hours lost" in relation to the "Exposure" factor in the form of the total hours worked. The "man hours lost" is not required in marine accident statistics, nor could it be very accurately calculated by a shipowner operating a large number of vessels in various trades and services. As mentioned before, statistics to be of value must be accurate; they must be workable; they should be as simple as possible. If a master or a chief engineer, a mate, seaman, steward, or fireman is temporarily incapacitated because of an injury while the ship is at sea, the vessel does not discontinue her voyage, the machinery is not shut down, the galley is not locked up and meals discontinued. The vessel proceeds on her passage, perhaps to be at sea for many weeks to follow, and the particular work of the injured person or persons is assimilated by some other member or members of the crew.

*Abstract of paper read before the Marine Section of the National Safety Council at Chicago, October 1, 1929.

Report of Personal Injury or Illness (Vessel Form)

1. Name of vessel ...... Date injury or illness occurred.. Hour A. M. P. M. ......
2. Was ship at sea or in port? .... What port? ....
3. Name of sick or injured person .... Age......
4. Address ....
5. Married or single?.. .... Color .... Sex ....
6. Occupation .... Rate of pay ....
7. Name and address of nearest relative ....
....
8. Employer's name............ How long employed? ....
9. (a) How did accident happen? (Give full description here and on reverse side), ...
....
....
....
(b) Principal complaint made by sick person ....
....
10. Nature of injury or illness............
11. If ill before embarkation, by whom treated? .... Where? ....
12. Probable period of disablement ....
13. To whom was injury or illness reported? .... Date reported? ....
14. What was done for sick or injured person? ....
15. Name and address of attending physician............
16. If taken to hospital, name and address of hospital ....
17. Has he left the ship? .... When? .... Where? ....
18. Was he paid off? .... Before whom? .... Amount paid............
19. When was crew paid off for this voyage? ....
20. When did he sign on? .... Where? .... Before whom? ....
21. Name of person in charge of work at time of accident............
22. Name of machine, tool or equipment involved in accident. ....
23. Condition of machine, tool or equipment............
24. Name defects, if any............
25. Was he sober? .... Was he careless? ....
Was another person at fault? ....
26 Names and addresses of witnesses to accident or those who knew of illness and treatment afforded:

....
....
....
....

Dated .... Signed............
Master or Officer

Form of report for personal injuries aboard ship used by The Texas Company.

It is one problem to formulate and successfully pursue accident prevention work among seafaring personnel, and another to assemble and prepare the records in proper statistical form. This article has not dealt with the former subject but it has been assumed here that a shipping organization is actively engaged in accident prevention work. Statisticians can only prepare their records from information furnished to them; the more complete the data the more illuminating will statistics appear. This should be borne in mind by those executives charged with this duty by their respective companies and especially by the masters of the vessels whose complete and accurate reports of accidents when they occur are the crux to the entire subject of having statistics as an aid in maritime accident prevention.

The movement for a national marine safety code, fostered by the Marine Section of the National Safety Council and proposed to be developed in the usual manner through the American Engineering Standards Committee, culminated in a meeting at the Pennsylvania Hotel, New York, on October 1, 1928, when representatives of the shipowners, stevedores, longshormen, National Safety Council, American Engineering Standards Committee, U. S. Employees' Compensation Commission, insurance carriers, and others interested met to consider the proposal. At this meeting the shipowners and stevedores expressed their opposition to the bringing of other than maritime interests into the picture, and the proposal was not adopted. At this meeting, however, the American Steamship Owners' Association requested that it be allowed to sponsor the safety code and started work upon it through a specially appointed safety committee of its New York members. In March this committee completed a draft of safety rules which was approved by the association's executive committee. It was then transmitted to the other operators and stevedores for consideration. A joint committee then worked on the code and called officials of the International Longshoremen's Association into the conference. The code was finally approved by these organizations, printed, and is being used in the port of New York.

At Boston a safety code committee composed of representatives of the steamship owners, the stevedores, the longshoremen, and the insurance carriers was formed in June, after considerable preliminary discussion as to method of procedure, and at the time this is written had not completed its work.

After a preliminary meeting held early in March, a safety code committee for Texas ports was appointed from the various interests. It included owners, stevedores, and the longshoremen. This committee quickly came to an agreement upon a set of about 100 safe working rules, which were printed and adopted by the industry in Texas. This committee set up a permanent organization for the purpose of assisting the employers in the enforcement of the rules and arranged for financing the work. The Texas Employers' Insurance Company placed a full time safety engineer working with the employers of Galveston on their problems.

The Shipowners' Association of New Orleans undertook the drafting of the code for that port and at last reports had tentatively agreed upon a code similar to that adopted by the port of New York.

The greatest development of the maritime safety code work for the year occurred on the Pacific Coast. Seattle's port code had been previously adopted and was being used by practically all of the Seattle waterfront employers and by others in Puget Sound ports. San Francisco's safety code committee had been working for almost a year on rules for that port. These were completed, the rules for the guidance of stevedores and their foremen being adopted and published in September, and the rule book for longshoremen in December.

Los Angeles and San Diego ports adopted the San Francisco rules. In fact, their safety committees had worked upon their preparation and the rule books may be considered as a joint effort. In November the safety committee in Portland, Oregon, began the consideration of safety rules for the Columbia River ports. The San Francisco and Seattle rules differed in many respects due to the different viewpoints of the groups which developed them and in a slight degree to differing conditions. The prospect of a third, and still different code for vessels which regularly call at all of these ports suggested the need for a uniform code for the entire Pacific Coast. The proposal for coastwide cooperation in the development of such a code was made by the Federal Compensation Commission and was readily approved. Early in 1929, district code committees composed of representatives of all of the coast maritime associations and longshoremen's organizations, together with the deputy commissioners of the Federal Compensation Commission, were organized for the work. The San Francisco district committee acted as the clearing house for ideas, compiling suggestions from all the districts, and smoothing out differences. Six months of intensive work by the district and local committees resulted in agreement. On August 2 the Pacific Coast Marine Safety Code Committee met in San Francisco,

effected a permanent organization, considered the code, and gave it unanimous approval. It has since been printed and put into effect through the voluntary action of the industry.

This Pacific Coast Marine Safety Code for Stevedoring Operations Aboard Ships is by far the most comprehensive work of this type that has been done by our industry. It was drawn up and adopted under conditions which favored the fine results obtained. Local committees were already familiar with the making of local codes. The accident prevention work of the coast had been organized into two strong departments, which were able to direct the work and readily bring it before all of their member organizations. The information which these accident prevention departments had collected was available to show the types of injuries that were occurring and could back up suggested rules with instances of past experience. The accident prevention work had been carried on until there were plenty of experienced operating men ready to suggest what they considered the practical rule for meeting a situation. Safety codes of other countries and of State Compensation Commissions were studied in connection with the maritime experience, and the Federal Compensation Commission and the three State Compensation Commissions cooperated with the committees. The work had the support of the operators and the longshoremen's organizations, and the leadership of men trained in accident prevention, labor relations, workmen's compensation, and practical stevedoring and ship operation. The committee that gave its approval to this code would be the last to claim that it is a finished job, but the writer considers that it represents the right method of attack, and it is of a character that it can be used for the basis of other district or national codes for longshore work.

While considering safety codes, in the light of the progress of the accident work as a whole, it might be pertinent to point out that the final result, as set forth in a set of safety rules, is but a small part of the total value of the work. If the work is done through committees representing the entire industry, as it is being done in most of the ports at present, it brings the whole subject of accidents and their prevention to the attention of the leaders. It permits every point of view to be considered. Sometimes these are far apart to start with and necessitate compromises. But in the end, the men who have done the work and given it their approval have a much better knowledge of the safety work and are going to be strong advocates of it to their associates. Since the codes must be "sold" to the industry to receive its support, the influence of these men is of the greatest importance.

Organization Work

The organizations which were effected for the work of framing safety codes have been mentioned above. It is noteworthy that in every instance, the existing organizations of the shipowners, stevedores, and the longshoremen sponsored the code work and appointed representatives on the committees. Your attention is now directed to the other form of organization for accident prevention work that has been effected on the Pacific Coast.

The Seattle port safety organization, supported by the Waterfront Employers of Seattle, and carrying on organized accident prevention work in the port of Seattle, has been extended to the port of Everett and has increased the scope of its work somewhat.

The Columbia River Marine Safety Association, comprising Portland and the smaller ports on the Columbia River, has been organized and is carrying on an active accident prevention campaign, with a full time safety engineer in charge. The work is financed by the ship operators and contracting stevedoring members.

The Port of Los Angeles, which formerly was working through its safety committee, has employed a full time safety engineer to have charge of the work.

The organization for San Francisco Bay has been described. During the past six months San Francisco has joined with Los Angeles, San Diego, and the Columbia River group for still closer coordination of their work. The safety engineer at San Francisco, Byron O. Pickard, is now consultant for this entire group, and the whole work so far as it is controlled by associations and port organizations is closely correlated. Centralized control of statistical and educational work and a free interchange of experience is assured at less expense.

This broader type of organization has not displaced or interfered with the company organizations in these ports, but both supplements and assists them. The need for something bigger than the company organization in maritime accident prevention work has been stressed by many men who have spoken and written on the subject. The Pacific Coast is now giving the idea a practical trial. The purposes of the larger organizations in no way conflict with the company programs. They rather assist them by furnishing a much wider experience and a program of work based upon it. Foremen's safety dinners, poster service, special investigations that are made, and presenting the common interests of the larger groups can be handled better through the wider organization. The manner of organizing and carrying out the work within the company is still in its own hands, with the privilege of the consultation and assistance of the associations' safety engineers.

A Safety Acrostic

S afety First
T reat all wounds immediately
A careless move may mean painful injuries
N o oily rags should be left lying around
D rains should be opened before heads are lifted
A lways wipe up or throw sawdust on oil spilled on deck
R epair immediately faulty parts of machinery
D rydock workmen should not be given ship's rope

S afety Last
H eaving lines should be stowed when not used
I lluminate dangerous places when working at night
P erfect condition of gear is essential
P rotect your eyes with goggles when chipping
I nspect machinery regularly
N o smoking shall be allowed on deck
G ood health is necessary for safety

S afety Always
A ttempt no foolhardy stunts
F eel the engines with care
E merywheel work requires goggles at all times
T ake heed of all hazards
Y ou should be safety-minded
G angways should always be secure
R opes require frequent examination
A n open floorplate or hatch is dangerous
M ake sure lifelines are used whenever hazard suggests
S toppers (rope) should always be of new rope.

(Bulletin of Standard Shipping Co.)

Trade, Traffic, and Shipping

The Mississippi River as an Artery of Commerce

Inland Waterways Corporation Shows Great Growth of Water-Borne Freight on the Central United States River Systems

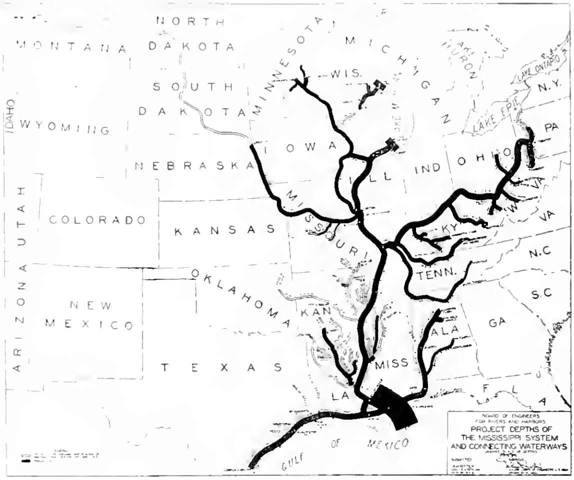
A GREAT pageant celebration was held October 12 to 18 in the form of a cruise from Pittsburgh, Pennsylvania, to Cairo, Illinois, to dedicate the recently completed canalization of the Ohio River.

This great engineering work has taken nearly fifty years and the expenditure of over $125,000,000. It includes over 50 locks and dams and provides a year-round 9-foot depth of navigable channel for the full length of the Ohio River, a distance of 968 miles.

The celebration was participated in by President Hoover, together with official committees from Congress and other federal officials as well as the governors of six states of the Ohio Valley. Colonel Thomas B. Esty, Pacific Coast representative of the Inland Waterways Corporation, attended as the official representative of the City of San Francisco and of the San Francisco Chamber of Commerce.

This work of canalization has been carried on by the United States Army Engineers Corps under the direction of the Board of Engineers for Rivers and Harbors. In cooperation with the United States Shipping Board, the Board of Engineers has recently issued a comprehensive report on the Mississippi System as an artery of commerce.

This report shows that the Mississippi River and its tributaries drain an area of approximately 1,239,000 square miles, or about two-fifths of the entire United States, the navigable channels of the system having a total length of approximating 15,000 miles. Throughout the interior of the country the products of agriculture and industry are being moved in constantly increasing volume over these inland waterways. In the banner year of the 19th century, 1889, the total commerce on the Mississippi River system was reported as 28,289,503 tons. In 1928,



Map showing extent of finished and projected navigable channels in the Miss'ssippi River System and Gulf Coast Tributaries.

after eliminating all known duplications, the total in round figures was 62,500,000 tons, an amount equal to nearly one-half of our entire foreign commerce for the same year.

The low water rates made possible on intercoastal traffic by the Panama Canal have resulted in a rail rate situation distinctly unfavorable to the central part of the United States. In searching for relief from these transportation hardships, the midwestern interests have turned hopefully to the waterways constituting the Mississippi System, and the development and utilization of these splendid arteries of traffic are solving many of their difficulties. More and more are they availing themselves of the low cost river transportation, both for the receipt of raw materials and for shipping the products of their farms, mines, forests, and factories. The improved channels and increased use of the inland waterways have resulted in greatly improved barge and boat service and in improved ports and terminal facilities along the various streams.

The Ohio river drains one of the richest valleys of the civilized world, and its improvement is of incalculable benefit to the vast industrial region through which it flows. The traffic on the Ohio River system for the year 1928, after eliminating all known duplications, was more than 46,000,000 tons.

The report discusses in detail the character of the commerce moving over the entire system, showing the movements of commodities by origin and destination. Numerous graphs and charts supplement the text and assist the reader to gain a better

conception of the significance in the economic life of the nation of this vast movement of river-borne traffic. Information is also presented in the report showing channel depths, ports, and terminal facilities.

There is every indication that inland waterways are steadily assuming greater and greater importance in the country's transportation structure. This is shown not only by the traffic figures but also by the continuance on a larger scale than ever of the aid rendered to the cause of river improvement by the federal government, as well as by plans announced for the extension of private and common carrier service, by the many substantial contracts awarded for new equipment, and by the building of municipal terminals. These new plans, new enterprises, new enthusiasms indicate that even the present large volume of river traffic is destined to be exceeded in the not distant future.

Of the manifold activities pertaining to the development of this vast system of inland waterways, the report gives a graphic and comprehensive picture. It should prove of special interest to transportation executives, to shippers desiring to avail themselves of the economies made possible by the operation of river freight carriers, to river communities contemplating the construction of new terminals, and to engineers and economists interested in the further development of our inland waterways.

Copies of the report may be obtained by addressing the Board of Engineers for Rivers and Harbors, the Shipping Board, or the Government Printing Office.

Improved Transpacific Transportation

Matson Navigation Company Institutes 8-Day Service Between New York and Honolulu

UNPRECEDENTED in American travel, special de luxe "boat trains" will be operated across the continent without change from New York to San Francisco for two sailings of the Matson liner Malolo to Hawaii this winter.

Plans for this luxurious innovation have just been revealed by the Matson Navigation Company in conjunction with the New York Central Lines and the Pennsylvania Railroad.

In Europe, "boat trains" are provided for the sailings of nearly all great liners from French and English ports. Here in America, prospective voyagers have had to depend on regular train service and arrange all transfers of baggage themselves.

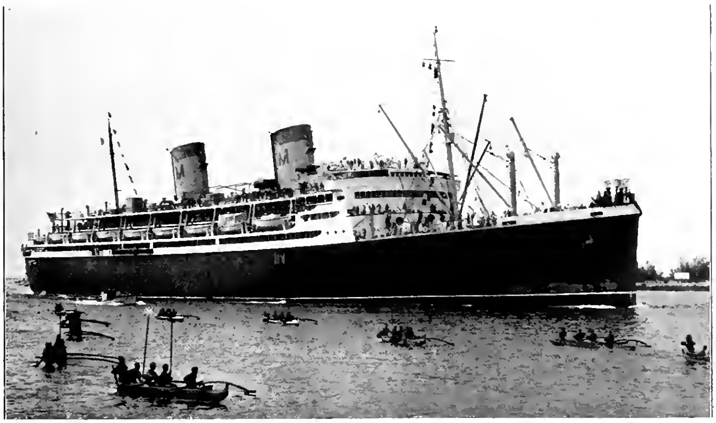
The Matson Line's startling departure of providing boat trains for Malolo passengers has been made possible by the fact that travel to Hawaii by the Malolo (the only four-day ship on the Hawaii run) has increased to such an extent as to justify special trains to take passengers from the East to San Francisco.

Hawaii as a glorious place to spend the winter has long been known to travelers, but it was only since the luxurious Malolo, one of the world's great liners, was put into service that Honolulu became a mecca for society, for millionaire sports lovers, and for the wealthy retired class who travel wherever luxury and ease are combined with fascinating variety.

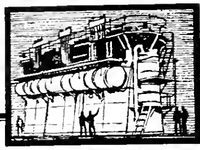
The first Malolo Boat Train will be operated for the January 25 sailing of the Malolo from San Francisco. Passengers will leave New York January 21 on either the 20th Century Limited of the New York Central or the Broadway Limited of the Pennsylvania, special cars being reserved for those booked on the Malolo. Other Malolo passengers may board these cars at any regular stop of the Century or Broadway. Arriving in Chicago, the Malolo cars will be combined into one special train without the necessity for change, other cars will be added to accommodate passengers starting from Chicago, and the Malolo Boat Train will continue to San Francisco over the Chicago & North Western, Union Pacific, and Southern Pacific railroads, on the route of the Overland Limited. Thus all bother of changing cars and fussing with baggage en route will be entirely eliminated.

Passengers will arrive in San Francisco Friday night, January 24,

(Continued on Page 33, Blue Form)



The palatial liner Malolo, speed queen of the Pacific, entering Honolulu Harbor



In the Engine Room

New Regulations for Motorship Engine Room

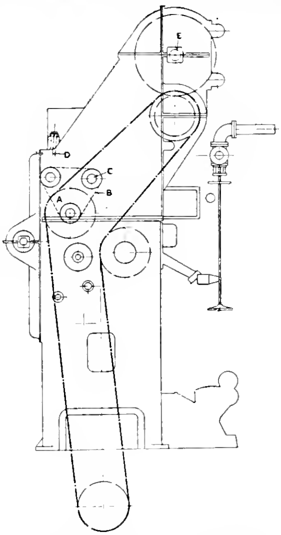
The Supervising Board for Boilers and Engines at Hamburg, Germany, Issues Comprehensive Regulations Covering Safety Practice for all Motorships in the Harbor of Hamburg

NEW regulations for the prevention of explosions on diesel-engined vessels have recently been issued by the Supervising Board for Boilers and Engines at Hamburg. These regulations are the result of an exhaustive inquiry into the causes of the fatal explosion on the motorship Kungsholm.

It will be remembered that the motorship Kungsholm was built by Blohm & Voss for the Swedish-American Line's New York passenger service and was engined with two 8-cylinder, double-acting, 4-stroke cycle diesel motors, each generating 7500 brake horsepower, built by Burmeister & Wain at Copenhagen and installed by Blohm and Voss under the supervision of Burmeister and Wain engineers.

The vessel left the builders' yard on October 13, 1928 and proceeded to sea for acceptance trials. Upon completion of the predetermined trials, including a six hour full speed trial and maneuvering trials, the ship proceeded under various bells toward port. After having been operated for approximately 20 minutes under a slow speed bell and five minutes at half speed, a violent explosion occurred in the machinery space, and upon examination it was found that this explosion had apparently first taken place in the crank case of the fourth cylinder on the starboard motor, being transmitted from there to the engine room.

Heavy smoke was observed coming out of the rear smoke stack, and the force of the explosion was such that the engine room skylight, weighing about two tons, was ripped from its fastenings and thrown overboard. Subsequently, a fire took place, but this was promptly put under control by the Blohm & Voss fire brigade who were on the vessel.



Diagrammatic end elevation of Kungsholm engine, showing, A, the jockey wheel for the main chain drive to the cam shaft.

Twenty-four persons were injured by this accident, two of these dying while on hoard and three dying after being removed to the Cuxhaven Hospital.

The Burmeister & Wain engineers, reporting to their home office, stated that a small explosion first occurred in the crank case, and this was followed immediately afterwards by a heavy explosion in the machinery room; the force of the original explosion ripped the outer crank case doors from cylinders Nos. 3, 4 and 6, and a flame of burning lubricating oil was ejected through these openings. Immediately before the explosion there had been a slight drop in the lubricating oil pressure and part of the staff were examining the lubricating oil pumps as the explosion occurred, and these were the ones most badly burned.

The explosion was transmitted through the upper engine room, causing the skylight to be torn loose and parts hurled overboard, and also extended under the floor plates on the starboard side, throwing many of these plates out of place, and traveled from the starboard side to the port side, indenting the sump tanks under the port motor and also crashing in the crank case doors on this motor.

At the examination of the starboard main engine it was found that the jockey wheel for the main chain drive to the cam shaft had heated. The wheel is made of cast steel and provided with two bronze bushes driven hard into the wheel, each secured by means of a tap bolt. The wheel revolves on a steel shaft which is fitted on a movable arm whereby the chain is adjusted. The chain drive is shown in the drawing herewith. The jockey wheel which had heated is marked A. This wheel works in a triangular piece B, revolving round a fixed bolt C which is tightened up by means of the bolt D. In conjunction herewith a smaller chain is fitted driving the indicator shaft, but this chain drive has no bearing on this case.

The chain drive must have been so tight that with full power it could just operate satisfactorily, and it is probable that the length variations which may have occurred in this motor, due to temperature fluctuations during maneuvering and after the long loaded trial, stretched the chain and caused an excessive pressure on the tension

roller; consequently, immediately after the last speeding up of the motor the heat of the roller rose to such an extent that the gas mixture in the crank case was ignited. On the collars of the bronze bushings deposits of coked oil were noted, showing clearly that ignition emanated from this point.

To cause an explosion, a combination of several unusual circumstances are necessary; i.e., the pressure of a part of the machinery sufficiently hot to cause ignition and a very definite mixture of oil-gas with air. The arrangement of crank cases, chain drive, and the pressure lubricating oil system is exactly the same in this instance as in all ordinary pressure lubricated diesel motors, and consequently the explosion can have no relation to the construction and operation of double acting diesels. Excessive heat is usually noticeable by odor, or smoke, or other well known indications, thereby giving the engineers an opportunity to stop the engine and examine the heated parts, and only under very special conditions could an experience like this occur.

The course of the explosion through the engine room led to the further supposition that explosive gases and/or oil dust were present there. The investigation after the explosion showed that the engine room staff used two containers, one on each side, which were filled with gasoline for cleaning the lubricating oil filters. It is regrettable that the erroneous employment of gasoline for cleaning filters was not noticed by the staff prior to the explosion, as it is the practice of the engine builders to clean strainers only by brushing off, blowing off, and possibly rinsing them, employing for such purpose only diesel motor fuel oil and using a special shallow barrel separated from the cofferdam surrounding the filter housings. The employment of gasoline for cleaning the filters, as well as the practice of keeping gasoline in open containers in the machinery space, is not permissible and it is regarded as highly dangerous at all times.

When the strainers were lifted out of the trays for cleaning, considerable gas formed which collected under and immediately over the floor plates in the machinery space; and the ignition of these gases was the cause of the violent secondary explosion and the large number of seriously burned members of the crew. It is further possible that when the strainers were cleaned, gasoline in small quantities may have gotten into the lubricating oil and been pumped into the main motors where even very small quantities of gasoline vapor will obviously greatly increase the danger of ignition of oil fumes in the crank case in case of overheating of any part within the crank case.

The engines had been installed for some time and clean lubricating oil had been circulated freely through all parts of the system for some fourteen days prior to the trial run. Shortly before the trial two large lubricating oil filters had been thoroughly cleaned with gasoline.

As a direct result of this explosion the regulations issued bv Hamburg include the following provisions:

"As explosive gas mixtures may be formed in the closed up parts of oil engines, special care must be given to these, particularly the crank case. It must be assumed that oil gases contained in the crank case will expand into the engine room if the engine is heated up or if the covers to the crank case are opened. It is, therefore, necessary to provide adequate ventilating arrangements, by which gases formed in the crank case may be led away. These ventilators must end at non-dangerous points and must be fitted with Davy safety wire gauze. The crank case should be tight against the engine room. It is also necessary to arrange efficient engine room ventilation in order that the engine room personnel may not be exposed to the influence of oil vapors or burnt gases if glands or pistons are not tight. The ventilation must extend to all parts of the engine room, including the lower and covered-in parts, and should be effected by ventilator pipes going through the floor plates.

"As the heating of bearings may also lead to the ignition of inflammable gases in the crank case, care must be taken in the construction and lubrication of the bearings so that excessive heating is avoided as far as possible. Lubricating oil collecting in the crank case must be led off by the shortest way in closed piping to the lubricating-oil collecting tank. If the pistons of the engines are cooled by oil, this oil must be led from the expansion joints in closed piping to the collecting tank. Oil dripping from other parts in the engine room must not be led into the crank case or into the collecting tank for lubricating oil, but to a special waste-oil collecting tank, from which it should go to the separators to be cleaned for reuse.

"In no circumstance is oily bilge water to be left for any long time in the bilges or to be pumped overboard without being cleaned.

"The storage and use of light inflammable oils (with an ignition point below 70 degrees F.) in the engine room is not to be permitted. If the use of such oil cannot be avoided, a special room must be provided for this work. This room must be separated gas-tight from the engine room and be fitted with special ventilation. The electrical installation in such a room must comply with the regulations for electrical installation in rooms exposed to danger of explosions, and good fire-fighting equipment must be provided."

A New Record in Low Fuel Consumption

Extraordinary Economy of the Holland-America Passenger Liner Statendam.

THE new Holland-America liner Statendam is apparently setting some very fine records for economy in fuel consumption. It is reported that over a long full power period during her first return voyage from New York eastward her fuel consumption worked out at 0.61 pounds of oil per shaft horsepower hour for all purposes. This includes all the oil used in the diesel-electric generating sets for auxiliary light and power but only the shaft horsepower of the main engines is used in figuring the specific consumption.

The Statendam is 670 feet long between perpendiculars with a molded beam of 81 feet and a draft loaded of 33 feet 6 inches. She measures 30,000 tons gross and her sea service speed is 19 knots. On the occasion of the test referred to above she averaged 22,350 horsepower.

Her power plant consists of six Babcock & Wilcox water-tube boilers supplying steam at 400 pounds working pressure and 650 degrees Fahrenheit total temperature to two sets of Parsons triple expansion turbines, each coupled to a propeller

shaft through single reduction gearing. The propellers run at 125 revolutions a minute, the low pressure turbines at 1500 revolutions a minute, and the intermediate and high pressure turbines at 1700 revolutions a minute.

There are four 400-kilowatt diesel-electric generating sets for auxiliary power and electric lighting. These generating sets are in their own compartment separating the forward and the after boiler rooms, and all three of these compartments are immediately forward of the main engine room.

In operation, five boilers give full power and one is a stand-by. The White system of oil firing is used. All auxiliary pumps except the four Weir direct-acting feed pumps are electrically driven. Steam for these pumps and for feed water heating, make up feed evaporators; galley uses and passenger accommodation heating is bled from the main turbines between the high and intermediate stage and between the intermediate and low stage. At maneuvering speeds this steam is taken from the main boilers through desuperheaters and reducing valves. Feed water is heated to 300 degrees Fahrenheit in two stages. Condensers are Weir underslung regenerative type served by Allen motor driven centrifugal pumps. The air pumps are Weir Paragon type motor driven. Vacuum augmenter ejectors with condensers are fitted. This combination holds a 95 per cent. vacuum.

A Convenient Calculating Graph

Any Root or Any Power of Any Number Easily Measured.

By W. F. Schaphorst.

SEVERAL years ago I wrote an article on how to extract any root or any power of any number which aroused considerable interest. But one letter which I received contained this comment: "The writer has just seen your chart for extracting any root of any number. If you will now tell us how to do the same with fractions and how to keep track of the number of digits in any case whether expanding to a power or extracting a root, we will erect a monument in your honor."

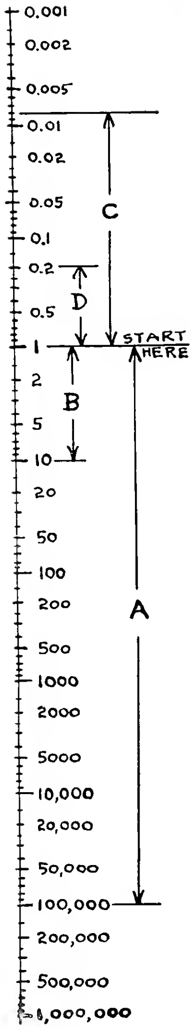
Whether or not this is a challenge, I do not know. If it is, I hereby accept the challenge. Not that I am looking for a "monument in my honor" but to show that it can be done and to give you something that I consider really valuable. I have prepared another chart which I trust will clarify matters for all time and which I am submitting herewith. Without doubt this is vastly superior to my previous chart. Besides, I doubt that anything like this has ever before been published. I shall tell you how I made it.

If you will take any slide rule and lay it end to end nine times and each time lay off the principal dividing lines you will have a chart exactly like this excepting that yours will be much longer and therefore it will be much more accurate. That is what I did in preparing this chart. Then I reduced it to this much smaller size. By following the above method you can make a chart that will go into the billions, trillions, or higher, as one limit; and a billionth, trillionth, or lower, as the other limit. There is no limit in fact. Then to keep track of the digits you simply read the numbers exactly as they stand on the chart. No juggling of digits is necessary. I do not know of any other method that is as simple as this. All other methods require "juggling of digits," as they say.

For example, what is the 5th root of 100,000? Measure the distance A from 1 to 100,000 as indicated on the chart. The distance B must then be exactly 1/5 of the distance A and there is your answer; namely, 10. In other words, divide the distance A by the root and the quotient shows you the distance to measure from 1 to find the answer. Always measure from "1" in either direction; "1" is always the starting point. To extract the square, cube, or other root of fractions is usually more complex than extracting roots of whole numbers. However with this chart one is just as easy as the other.

For example, what is the cube root of 0.008? Measure the distance C from 0.008 to the starting point "1" and divide it by 3 and you get the distance D which tells us that the answer is 0.2.

A method that is as easy as any to find a third, fourth, fifth, etc. of any distance, is to use a pair of dividers. Adjust the dividers until you get the distance D exactly 1/3 of the distance C and the chart gives the answer without any mathematical calculations whatever. With this chart you can determine the 3.127 power for instance—ANY power in fact. And you can extract the 4.37 root or any other root, all without mathematical jugglery. The "beauty" of it is: You have everything before your eyes in black and white.



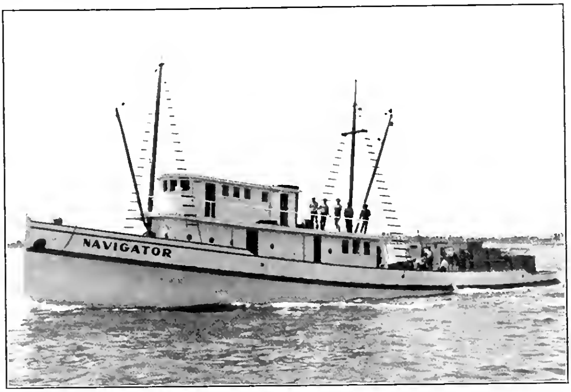
Workboats and Their Power Plants

Another California Super-Fishing Boat

ONE of the largest and best equipped fishing boats of southern California tuna fleet, the Navigator, started on her first fishing voyage early in September.

The Navigator is the product of the Campbell Machine Works of San Diego, California, and was designed by Manuel Madruga of that firm, who has been responsible for many of the larger boats of the tuna fleet. She was built for Manuel Freitas and is fishing under his command for the California Packing Corporation.

Her over-all dimensions are: Length, 120 feet; beam 27 feet; draft 10 feet, 6 inches; and her total cost was $95,000. Her power plant consists of one 400 horsepower, 6-cylinder, directly reversible, Union marine diesel engine, and this power plant drives the Navigator at a speed better than 12 knots.



The Navigator starting on her maiden trip.

The offshore fishing boats of the tuna fleet of southern California are being equipped with considerable auxiliary machinery. This is usually electrically driven, and to take care of this load the Navigator has a 45-horsepower, 3-cylinder, Union diesel engine, direct-connected to a 30-kilowatt Westinghouse generator and also a 45-horsepower gas engine direct connected to a 17½-kilowatt Westinghouse generator. One feature of the boat which requires special attention is the renewal of the supply of clean sea water to the live bait tanks. In order to assure this supply the pumping equipment is installed in duplicate and, so far as possible, the electrical generating plant is also divided, so that in case of the breakdown of one unit the other is immediately thrown into operation. On many boats a large storage battery is installed. Should the source of power or the pumping system completely break down for an hour or two, the live bait becomes dead bait and is no use for tuna fishing purposes.

As the work of tuna fishing extends farther and farther out into the Pacific and farther south, larger and faster boats will be required to make it pay. It is safe to say that in no field of ship and engine construction have the requirements been changing quite so rapidly during the last three or four years as in this particular branch.

Puget Sound Workboat Notes

Mojean and Ericson of Tacoma are completing work on a new freight and passenger steamer for Lorenz and Berntson of Tacoma for use between Tacoma and North Bay. She will have a 200-horsepower triple-expansion steam engine and is 95 feet long, 25 feet beam, and 5 feet draft.

Western Boatbuilding Company of Tacoma has finished work on a combination purse seiner and tuna ship for California order powered with a 180-horsepower **Atlas-Imperial** diesel. She is 77 by 21 by 6 feet.

Fishing Vessel Owners' Marine Ways, Seattle, is completing work on a new combination halibut boat and purse seiner with dimensions of 50 by 12½ by 6 feet 6 inches, powered with a 50-horsepower **Atlas-Imperial** diesel.

King Shipyards, Seattle, are completely rebuilding the Puget Sound steamer, F. C. Reeves and the Hyak for the Kitsap County Transportation Company.

L. E. Geary, naval architect, Seattle, has finished plans for a new wood, diesel driven patrol ship for the California State Bureau of Fisheries. She will be 86 feet long, 18 feet 6 inches beam and 8 feet draft and be powered with a 200-horsepower diesel.

One of the finest yacht construction jobs under way in the Northwestern yards at the present time is the new 107-foot twin screw diesel

(Continued on Page 37, Blue Form)

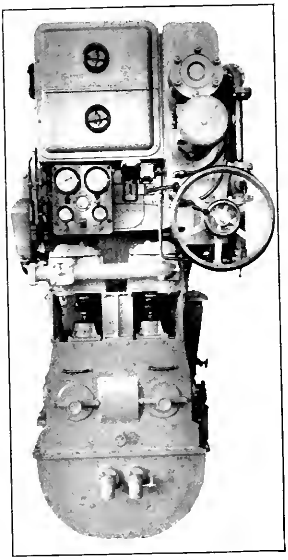
The New Winton 8-Cylinder Diesel

A NEW 8-cylinder, airless injection, marine Winton diesel has been added to the line of the Winton Engine Company. This new engine—a beautiful piece of engineering—has demonstrated a very high mechanical efficiency and low fuel consumption and is, in the words of the builder, "the smoothest-performing diesel engine developed up to the present."

The new unit, Model 157, has $16\frac{1}{2}$ inches bore, 26-inch stroke and was designed to develop 1100 horsepower at 250 revolutions per minute. In official shop tests, however, the engine developed approximately 50 per cent more power than its rating calls for.

The over-all length of the unit is 30 feet $1\frac{1}{4}$ inches; height from center line of crankshaft to top engine, 9 feet, $6\frac{1}{2}$ inches; over-all width 7 feet 5 inches.

The design is noteworthy because of its simplicity and compactness. A striking change in appearance is noticeable in the forward end, where the control mechanism and all pumps are now located instead of at the side. This change makes the engine handy to control, and leaves the crank case hand-hole covers free of all obstructions.



Forward end of the new Winton-8 marine type diesel engine showing convenient controls and instrument board.

Fitted with pneumatic reversing gear and pneumatic brakes, this unit lends itself to easy and rapid maneuvering. Reversing is accomplished by admitting starting air from the air tanks through a 4-way valve to the reversing air cylinder, which throws the reversing cams into contact with the rocker arms.

The pneumatic brakes, one on each side of engine, consist of an air cylinder and set of brake shoes. A 3-way valve is opened by the operator when the engine is being stopped, admitting air into the brake cylinders and bringing the brake shoes into contact with the side of the fly-wheel rim. When the engine is stopped air in the air cylinders escapes through relief valves, and the brake shoes are released by spring tension.

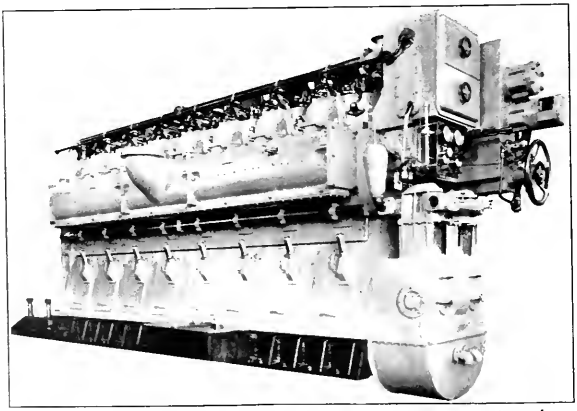
The engine, following Winton practice, is of the 4-cycle, single acting, trunk piston type. Cylinder block, cylinder heads, cylinder liners, and bottom and top crankcases are made of close-grained chrome nickel iron. The cylinder block and the two halves of the crank case, each of which is a one-piece casting, are securely bolted together in a rigid assembly by eighteen through steel tiebolts which take all the firing stresses. The cylinder heads are cast individually, secured to cylinder block by high carbon studs, and are readily detachable without removing intake or exhaust manifolds. The cylinder liners are ground and machined to mirror smoothness and are removable, thereby reducing upkeep.

Intake and exhaust valves, as well as the mechanically operated injection valves, are mounted in removable valve cages in the cylinder heads. Inlet valves are special alloy steel forgings, with head and stem integral. Exhaust valves are nichrome steel forgings, and the exhaust valve cages are water-cooled. Each cylinder head carries five valves — two intake, two exhaust, and one injection.

Calculated to reduce inertial forces to a minimum, aluminum alloy pistons and light drop-forged connecting rods are used. Six rings are carried in the piston; wrist pin bearings are in the piston bosses. Connecting rod boxes are of manganese bronze lined with best grade of high speed, heavy duty babbitt.

The $11\frac{1}{2}$-inch high carbon steel crankshaft is a beautiful piece of work. The entire shaft is machined and is drilled from main bearings through cheeks and pins for pressure lubrication. The main bearings, carried in the bottom half of the crank case, are steel shells, lined with best high-grade babbitt, centrifugally forced into bearings and scraped to running fit.

The camshaft is carried in a housing at the top of the cylinder



Exhaust side of new Winton-8 diesel. Note pleasing simplicity and ruggedness of the design.

block and is driven by a train of helical spur gears on the rear end of the engine. It is a high carbon shaft of the built-up type; the cams are drop-forged molybdenum steel, hardened and held to shaft by taper pins.

The fuel pump is a 3-cylinder. plunger type, with steel cylinders and hardened and ground plungers. The pump is enclosed in a housing, together with hand high-pressure fuel pump and fuel pressure regulating valve. The three fuel pumps and hand pump discharge into the same manifold, from which fuel is admitted to the cylinders through mechanically operated injection valves. Regulation is obtained by reducing oil pressure and varying duration of opening of the injection valves.

Lubrication is force-feed, oil being filtered and delivered by the main oiling system to the main bearings, connecting rod bearings, wrist pin bearings, cam shaft and vertical shaft bearings and gears.

Water and lubricating pumps, located on the front end of the engine, operate at one-fourth engine speed. They are of the reciprocating type, gear driven, insuring ample oil for all bearings and sufficient cooling water.

The engine starts on low pressure air—350 pounds per square inch. Oil filter, oil cooler, and intake muffler are standard equipment.

Another Diesel-Electric Tanker

Pusey & Jones Corporation Building a Second De La Vergne-General Electric Coastwise Tanker.

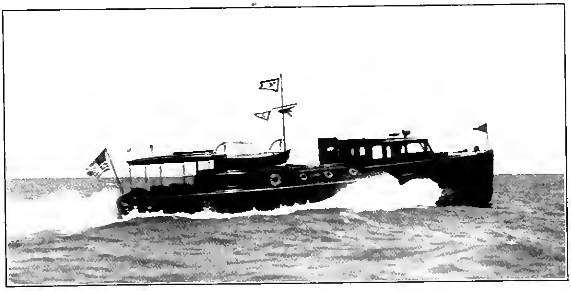
CONSTRUCTION is soon to commence on a second coastwise, diesel-electric tanker for the Tide Water Oil Company to carry gasoline and lubricating oil. Like the first boat, Tidewater, her capacity will be approximately 20,000 barrels of gasoline and approximately 55,000 gallons of lubricating oil, the latter to be carried in individual tanks in the forward hold space. Her route will be along the Atlantic coast, the same as her sister tanker and she will carry a crew of 18 men.

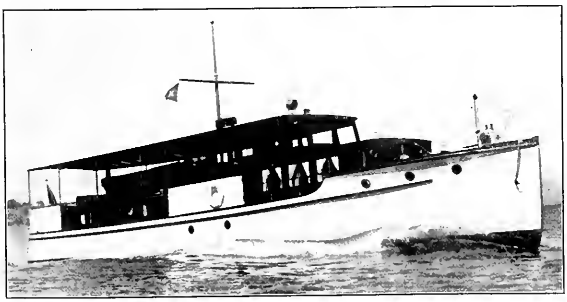
With the exception of minor changes, this vessel will be a duplicate of the first, which was described and illustrated in Pacific Marine Review for March and June, 1929. The hull will have an Isherwood type frame and is being built and equipped by The Pusey & Jones Corporation of Wilmington, Delaware. The vessel will have a length of 255 feet, a beam of 44 feet, a loaded draft of approximately 15 feet 6 inches, and a deadweight of about 2400 tons. The diesel engines will be built by I. P. Morris & De La Vergne, Inc. The generators and other electric equipment will be furnished by the General Electric Company.

The power plant will consist of two 6-cylinder, nonreversible, heavy-duty, solid-injection oil engines rated 625 shaft horsepower at 225 revolutions per minute. These will be direct-connected to 2 direct-current generators each rated 410 kilowatts, 225 revolutions per minute, 250-volts, shunt wound.

In addition to the two main generators there will be three auxiliary generators, each rated 45 kilowatts, 240 volts, compound wound. Two of these generators will be mounted on shaft extensions of the main generators, and the third will be direct-connected to a 3-cylinder, solid-injection, Winton engine. These three generators will furnish power for excitation and also for lighting and the operation of auxiliaries.

The propulsion motor will be a double-unit machine rated 1000 shaft horsepower, 130 revolutions per minute, 500 volts. It will consist of two 500-horsepower, 130-revolutions per minute, 250-volt motors mounted on a common shaft with two bearings and base.





Above, the Blue Moon, owned by Benjamin R. Meyer, of Los Angeles. Designed by Luders Marine Construction Company and built by Fellows & Stewart at Los Angeles Harbor, she is powered with two Sterling Coast Guard model, 6-cylinder, gasoline engines which drive her easily at a speed of 28 miles an hour.

At left, the Cherie, built by Stephens Bros. of Stockton, California, for the Axelson Machine Company of Los Angeles. Length 55 feet, beam 3 feet 10 inches, speed 18 miles an hour, with two Sterling 150-horsepower "Seagulls."

Auxiliaries-Ship Supplies-Marine Equipment

Dry-Docking Loaded Vessels at Newport News

View of the damage to the bow of the Eurana. As shown here in dry-dock, the Eurana was loaded with 6535 tons of general cargo.

ASIDE from the obvious advantage in principle of a graving dock, the dry-docks at the Newport News Shipbuilding and Dry Dock Company have recently made it possible for ship owners to effect savings on discharging and reloading cargo as a result of hull damages. This company makes a practice of dry-docking loaded ships when immediate repairs are necessary. The expediency of putting a loaded vessel on drydock has been successfully demonstrated by this yard in a great number of cases. In each case satisfaction has been unanimously expressed by all parties interested, as concerns the procedure followed and the result of the docking.

During the month of September, two loaded vessels were resting on the keel blocks and cribbing of the graving docks at the Newport News Shipbuilding and Dry Dock Company. One vessel, the steamship Tugela, was loaded with 6400 tons of miscellaneous freight and had her stern frame renewed. The other vessel, steamship Eurana, was loaded with 6535 tons of general cargo, and underwent extensive bow damage repairs.

The steamship Tugela has a length of 380 feet with a beam of 52 feet and displaced approximately 11,500 tons when she entered Dry-Dock No. 2 with a draft of 25 feet 6 inches forward and 25 feet 8 inches aft. This vessel sustained her damage and proceeded to Savannah, Georgia, whence she went to Newport News. While the vessel was at Savannah, a representative from the ship repair section of the yard surveyed the vessel and agreed with representatives of the owners and underwriters to bring the vessel to Newport News and effect repairs without unloading the cargo. The new stern frame was of cast steel obtained from Penn Steel Casting Company in two sections.

Steamship Eurana has a length of 400 feet and a beam of 56 feet, and displaced approximately 11,700 tons when she entered Dry Dock No. 3 with a draft of 22 feet 6 inches forward, and 23 feet 2 inches aft. This vessel was in collision in Chesapeake Bay and proceeded directly to the yard for survey. After consulting with the ship repair section of this yard and the classification society surveyor, the owners immediately decided to dry-dock the vessel and accurately determine the extent of the damage. After surveying and agreement of prices, work was immediately started. This damage involved 29 new shell plates, three plates removed, faired and replaced, 13 plates released, faired in place and refitted, and other extensive internal renewals and fairing. As the damage to the vessel was in way of cargo, a small amount was shifted and watchmen assured safety of cargo at all times.

The extensive facilities of the Newport News Shipbuilding and Dry Dock Company are generally known in most shipping circles. However, docking loaded ships seems to be a last consideration with most owners. When loaded vessels have been docked at this yard, every precaution has been taken to insure a considerable safety factor, particularly as regards weight per square inch on supporting blocks and cribbing. Whenever a loaded ship is docked, the owners and classification society surveyors are informed in detail of the calculations made, and the extent of cribbing. Their approval is always obtained before the vessel is docked.

When a vessel is damaged with her holds full of cargo, it is not only the expense of unloading and reloading cargo that the underwriters (ultimately the owners) face unless the vessel is docked loaded, but also the demurrage on an idle ship and other miscellaneous expenses such as the subsistence of the crew, all of which may easily amount to 10 per cent of the damage repairs. Resort is often made to temporary repairs to avoid unloading cargoes, which is usually an unnecessary expense when graving docks which are capable of docking most loaded vessels are available in conjunction with other facilities to effect prompt permanent repairs.

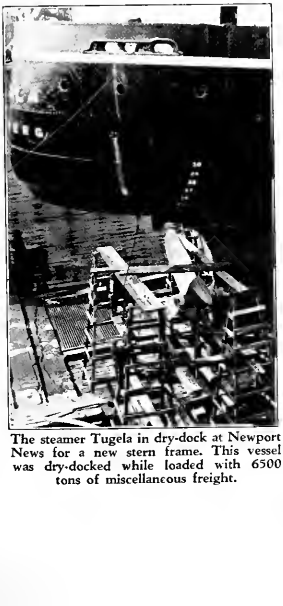
West Alsek's First Voyage A Success

Todd Unit System of Pulverized Fuel Burning Demonstrates Remarkable Economies

THE steamship West Alsek was the first vessel to make a transatlantic voyage depending wholly on pulverized coal; this voyage beginning and ending at Baltimore, via New York, Glasgow, Avonmouth, and Cardiff, with a total steaming mileage of 7124 miles and 300 hours in port; this voyage ended August 17, 1929.

Notwithstanding the fact that there were six different grades of coal bunkered and actually burned on this voyage and that test experiments were proceeding with these coals for much of the elapsed time; nevertheless the United States Shipping Board, as owner, declares that a 9 per cent increase in speed has been obtained with a substantial reduction in fuel costs.

Increasing the average speed 9 per cent required an increase of 20.2 per cent in the propeller power. It is therefore apparent that there was sufficient increase in the boiler efficiency to provide for this increased power as well as for the additional steam used by the coal pulverizing machinery and still show a saving in cost per fuel mile as compared to this ship's best previous performance as a hand fired job.



The steamer Tugela in dry-dock at Newport News for a new stern frame. This vessel was dry-docked while loaded with 6500 tons of miscellaneous freight.

The type of pulverizing mills used on the steamship West Alsek was an improvement over that used at the navy yard tests and resulted in a marked saving of power used to drive them. On the first voyage it was found that only 1.94 per cent of the total power was used for this purpose; this in view of pulverizing six different grades of coal is well worthy of note.

The total power required to operate the mills, elevators, crushers, screw conveyor, and magnetic separators was 2.19 per cent of the total horse-power, while the total steam consumed by all the coal burning gear was only 5.36 per cent of the total evaporation of all boilers.

As a hand fired job this ship burned 464 pounds of coal per mile with a speed of 8.78 knots and 1790 indicated horsepower. The coal was run of mine which costs $4.80 per ton trimmed in the bunker; the cost per mile was therefore $0.994.

As a pulverized coal burning job this ship burned 449 pounds of coal per mile with a speed of 9.58 knots and 2250 indicated horsepower. The coal cost $3 81 per ton trimmed in the bunker, the cost per mile was therefore $0.763.

To accomplish 9.58 knots as a hand fired job would require 583 pounds per mile with $4.80 coal and the cost per mile would be $1.249.

The actual saving in cost per fuel mile is shown to be 38.9 per cent when the ship does a like amount of work burning pulverized coal as compared to a hand fired job.

The steaming distance between New York to Glasgow and Cardiff to Baltimore was 6319 miles; as a hand fired job at 8.78 knots the time would be 719 hours; as a pulverized coal job the time was 659.5 hours, or a saving of 59.5 hours.

As a hand fired job and at 8.78 knots the coal for the above steaming time would cost $6,268.63; as a pulverized coal burner at 9.58 knots the coal cost $4846.66, or a saving of $1421.97 based on American prices at the current market.

As a hand fired job it would be necessary to bunker 1336.5 tons of coal for this steaming time; as a pulverized coal burner 1266.6 tons were necessary, or a saving in weight of 5.23 per cent.

In addition there was a saving of 20 per cent in fire room crew and the earning power of the ship is increased by reason of faster time.

The coals bunkered and actually burned were:

	B.T.U.	Volatile	Ash
Scotch, standard ship bunkers, at Glasgow	11,675	24.85%	20.6 %
Penn. Bitum. Slack, at New York	13,350	30.3 %	13.55%
W. Va. Bitum. Slack, at Norfolk	14,100	25.35%	8.1 %
Welsh-Smalls, at Cardiff	13,725	29.4 %	9.7 %
Welsh-Smalls, at Cardiff	13,550	35.55%	8.5 %
Semi Anthracite Duff, at Cardiff	14,600	12.35%	6.05%

With the exception of the Scotch standard bunker coal, all coals were slack or duff grades which could not be used to accomplish the given economies on a hand fired job.

The above comparisons as a pulverized coal burner were made on the basis of the ship's performance as actually run; no deductions or additions due to delays or decreases in efficiency have been made and it becomes self-evident that the subsequent voyages will show an increase of savings above those set forth when experiments of various kinds do not interfere.

Pacific Marine Review Back Numbers Wanted

One of our valued readers is very desirous of obtaining the following old numbers of Pacific Marine Review to make complete bound volumes:

1913: June.
1914: January, April, May, July, September, October, December.
1915: March, April, September, November, December.
1916: January (2), October, November, December.
1917: January, March, November.
1918: January, June.

Anyone wishing to oblige us with these volumes kindly address Editorial Department. We will be glad to take care of all expense in connection with obtaining these books.

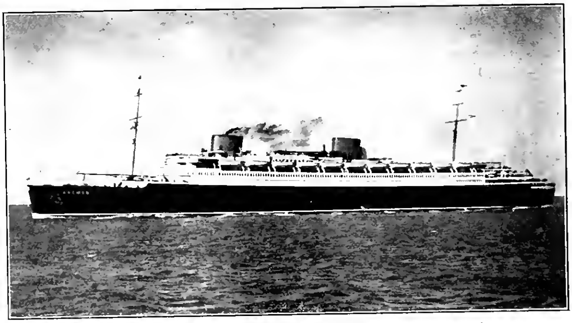
Measuring Speed of the World's Fastest Liner

Sal Log Equipment is Installed on Steamship Bremen of the North German Lloyd

PRESSURE created by the speed of a fluid is directly proportional to the square of the speed. This principle is well established in hydraulics and has been used as a basis for the so-called Pitot-tubes for measuring velocity of fluids in pipes or streams. Some years back the SAL Company of Sweden adapted the Pitot-tube to the measurement of the speed of ships and worked out a very ingenious electrical recording device through which the pressure in the tube created by driving it through the water under a ship's bottom was converted into an indication of the ship's speed in knots and a record of the distance traveled.

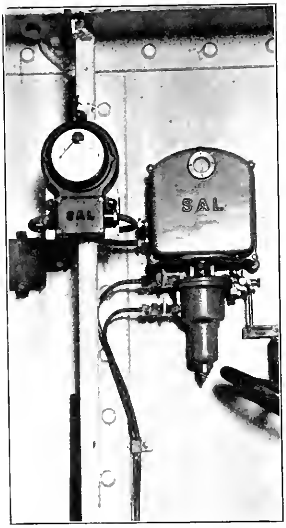
This instrument was called the SAL log and it has been in constant use for 10 years or more in most of the navies of the world. In several United States cruisers and submarines the SAL log has been in constant use for seven years and has given absolute satisfaction.

As used in the navy, these logs are somewhat expensive for most merchant marine installations and the SAL Company is now manufacturing a new and more simple type known as the SAL-12 which performs reliably and accurately at much lower installation costs.



Remarkable photograph of the greyhound of the Atlantic making 29 knots.

The Sal indicator in the pilot house of the Bremen.



The Sal log and speed recording device as installed on the steamship Bremen.

Our illustrations herewith show this new type as installed on the Bremen, fastest passenger liner in the world.

The Pitot-tube on these instruments projects 12 inches below the ship's bottom. Should this tube for any reason be broken or bent it is replaced by a spare Pitot-tube always carried on the ship. The Pitot-tube is inserted through a sea-cock and can be easily pulled in if desired. If bent, the old tube is simply pushed out by the new one taking its place.

SAL logs are distributed in the United States by the Battlog Co., Inc., New York.

The Sharples-Westinghouse Oil Centrifuge and Filter

THE largest portable combination centrifuge and filter press on the market is now being offered through the Westinghouse Electric and Manufacturing Company. It is the Sharples Combination Portable Super-centrifuge and Filter Press, and is made by the Sharples Specialty Company. A Sharples super-centrifuge is combined with Westinghouse filter press equipment and mounted on a truck. The following advantages characterize it:

Thoroughly cleans 1200 gallons of oil per hour continuously;

Purification is complete in one operation;

Operation is simple and clean;

Practically no oil is lost in handling;

Construction is sturdy and simple;

Maintenance is remarkably low;

Occupies very little floor space—only a space 54 inches by 106 inches; and

Can be easily moved from place to place.

This outfit fills the needs of those who have large amounts of oil to clean quickly and satisfactorily.

Protecting Pacific Ocean Shipping

Fathometer Being Installed on the Motorships of the South African Dispatch Line

FOUR motorships of the South African Dispatch Line, operating out of Pacific Coast ports to ports of East and South Africa, are to be equipped with the Fathometer by the Submarine Signal Corporation. The instrument is already in use on the motorship West Honaker; and installations will be made as quickly as is practicable on the motorships Crown City, West Cusseta, and the West Grama. These installations will be of great benefit to the navigators of these ships and will insure safety in unfamiliar waters.

The Fathometer gives to the navigator a reliable and a practically instantaneous indication of the exact depth of water under his keel. By its constant use he can get a moving picture of the contour of the ocean floor under his vessel and can check on his charts.

Charts are not always correct; and even if they are correct on one voyage, they may be incorrect on the next. The ocean floor is not a fixed quantity, but a decided variable. The attention of many Pacific Ocean navigators has been directed to this fact very vividly on finding islands where clear, deep water was indicated on their charts. The United States cruiser Cleveland recently sent the following radio message from Pacific Ocean waters off Central America.

"Sounding taken August 4 shows 4½ fathoms in latitude 11:54 north and longitude 86:36 west near where the chart shows 37 fathoms. Also soundings of 8½ fathoms in latitude 09.12 north and longitude 84.51 west where the chart shows 268 fathoms."

The Hydrographic Office has been broadcasting this information to warn ship masters; and that is a great service. But these two soundings may be only two isolated spots in a general unstable situation. One is about 13 miles off the coast of Nicaragua; the other 30 miles off the coast of Costa Rica, practically in the route of intercoastal vessels. On one, the chart shows 222 feet and the soundings 37 feet; on the other the chart shows 1608 feet and the soundings 51 feet.

There have been a number of strandings recently along the Central American and Mexican coasts and it would be interesting to know just how the charts compared with soundings at points where these strandings happened.

Ships equipped with the Fathometer have a continuous accurate check on any chart discrepancies and are able to navigate with assured safety so far as stranding is concerned.

C. V. Lane, sales engineer, San Francisco, is distributor for the products of the Submarine Signal Corporation on the Pacific Coast.

A Sperry gyro-stabilizer and the group of experts who witnessed its factory test at the South Philadelphia Works of the Westinghouse Electric & Manufacturing Company. This stabilizer is one of three being built for Westinghouse for the Sperry Gyroscope Company, to be installed in three large yachts now building at The Pusey & Jones Corp., Wilmington. Front row, left to right: J. O. Hazzard, A. S. Fisk, A. Schein, S. Isenbeck, A. G. Spiegelhalter, Jr., F. P. Hodgkinson, Capt. A. L. Blake. Back row: W. H. Beattie, L. D. Howell, Carl Lamb, K. Artemieff, B. Sunnstrom, L. Lutoff, Capt. E. Anderson, and A. Mason.

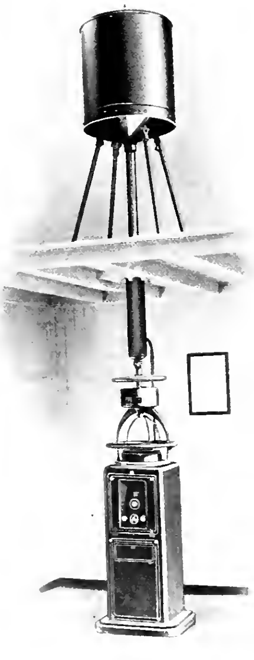
A New and Improved Lift Truck

THE Footlift is a new type of lift truck designed and built by the Lewis-Shepard Company. This truck differs in many respects from the usual type of single stroke hand lift truck. Elevation of the load is obtained by the operator stepping on a lever and letting his weight do the work. It is simple in construction, with all members of heavy duty materials, no close tolerances, several new safety features, and a vertical release check.

Noteworthy is the fact that the handle is used only for steering and hauling; a simple twist in its upright position prevents it from falling when not in use. An important feature is that the handle is never connected with the load. So there is no danger of a disengaged handle permitting the operator to fall over backwards when pulling on the handle to elevate the load. Practically no head room is required to elevate the load — the operator stands close to the load when elevating it. Tests show the Footlift can elevate the load and get away in almost exactly half the time it takes to elevate and start the same load with other single stroke lift trucks. This Footlift is believed by the Lewis-Shepard Company to be the most important improvement in lift trucks ever announced.

An Improved Kolster Radio Compass

A TYPICAL installation of the Kolster radio compass is shown in the illustration. In assembling the directional antenna for this instrument a rectangular loop frame is wound with several turns of special radio frequency cable to form a coil. This frame is mounted edgewise on a vertical hollow shaft which extends through a suitable housing into the room in which the receiver is located. The shaft and its frame are free to rotate and are supported on a ball thrust bearing so that the vertical center line of the shaft runs through the center of a compass card supported on the top of the receiver housing. The shaft is rotated to any desired position by a hand wheel. At the lower end of the shaft a pair of sight wires are stretched for taking readings on a compass card, an azimuth circle, or a Sperry gyro-compass repeater. Thus at any time the angular difference between the radio bearing of a shore station or another ship and the magnetic north, true north or ship's direction (depending on the type of installation) may be read directly.



Improved standard model Kolster radio compass Type AM 4490 C.

A great improvement has been added recently in the carefully designed non-magnetic housing for the coil frame. This housing is composed of a bronze tube which carries on its upper end a cast bronze circular pan having a vertical flange on its outer edge. This flange has a finished inside diameter of 23 inches. A seamless cylinder of Bakelite fitted to the inside of this flange carries at its top a cast aluminum cover. Inside this housing the loop frame is carried on ball-bearings and may be spun to desired position entirely free from any influence of wind, spray, snow, or ice.

Another improvement is the new dust and moisture proof collector system located just under the loop. This collector system conveys the current impulses from the loop to the receiver.

A new and improved automatic compensator in a dust proof case is installed directly under the handwheel. The Kolster mechanical compensator automatically applies a correction determined when the instrument is calibrated and thus, by making the compass direct reading, eliminates possible errors of personal equation.

Perhaps the most striking improvement to the indicating end of the Kolster compass is the so-called "Visual Bearing Unit." A small Neon lamp flashes the characteristics of the transmitting station and this lamp is so located that at relatively short distances it can be used to indicate accurately the true bearing as it will cease to glow between two readings of the sight wires, the mean of which will give the correct indication. By this means a reading accurate within 2 degrees can be obtained over a distance of 25 miles. This visual indicator possesses several advantages not possible with earphone work. For example, the navigating officer can set the compass coil at such an angle that the signals from a land station or another ship will cause the lamp to glow the moment his ship comes into a dangerous position. Since this lamp when glowing is visible from any position on the bridge, it is evident that this is a very valuable warning, especially as its flash will warn in ample time to take radio bearings and act to avoid the danger.

Junior model Kolster radio compass, Type AM-5000

Indirect illumination of compass card and of turning dial make for better bearings at night. A new and improved balancing system insures greater accuracy by giving sharper minimums. The improved type 8-tube receiver has a circuit especially designed for radio compass work and an induction suppression circuit so tuned that it is highly responsive to signals of the 800 cycle range to the exclusion of other noises.

In the base of the receiver are compartments for head phones and for batteries.

Believing that radio beacon service should be made available for all vessels, large and small, the Federal Telegraph Company has developed the Type AM-5000 Kolster radio compass which is an accurate instrument, specifically designed for smaller vessels where space is limited and where the cost may be an important factor.

A typical installation of this type is illustrated herewith. The coil is wound on a cylindrical Bakelite frame and, as illustrated, is mounted directly on the receiver case. This arrangement is for installation in wooden cabins or deck houses. In a steel house the coil would have to be mounted outside as with the standard type.

Bearings are taken with this type exactly as they would be taken with a pelorus on fixed visible objects. When the coil is at right angles to the incoming radio wave,

the signal fades out entirely and this position of silence is sharp and critical and indicates the bearing with great clearness. This bearing is that of the sending station with respect to the center line of the ship or her course.

The new Kolster radiocompass, both in the standard and in the smaller type, should greatly improve the safety of navigation in fog infested waters.

The Kolster radio compass is distributed in the United States by the Mackay Radio and Telegraph Company, which maintains offices and technical staff in all principal ports and is prepared to render valuable advisory service to interested shipowners.

Paracoil Equipment on Steamship Pennsylvania Duplicates that of Sister Ship

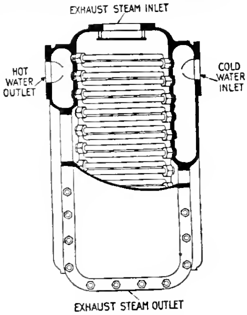
An interesting side light on the mechanical equipment of the steamship Pennsylvania is that the Davis Engineering Corporation, which furnished the equipment for the sister ships California and Virginia, was asked to duplicate its order of Paracoil equipment for the Pennsylvania.

This continued selection of Paracoil equipment resulted not only from the fact that the equipment was on the California and Virginia but also from the fact that for many years Paracoil equipment has been giving satisfactory results on such vessels of the International Mercantile Marine Company as the Mantauk, Montana, Mongolia, and Manchuria.

Among the more important Paracoil equipment furnished by the Davis Engineering Corporation for the Pennsylvania is the Improved Paracoil Feed Water Heater. This improved type has points of superiority over old style feed water heaters. Coils are of the flat spiral type and connection of the coils to the manifolds is accomplished by means of composition union connections free from brazing. The manifolds themselves form a part of the heater shell which is of cast iron. The coils are installed just like the shelves of a closet; when the heater door is unbolted the coil joints are readily visible in two vertical rows just inside the door. The coil joints of any coil may then be loosened and that one removed without disturbing the connections of any other coil. This is a convenience not available in any other feed water heater now on the market.

Each coil itself is of copper, held in shape by copper-faced bars bolted together. These bars rest on a supporting coil ladder in such manner as to prevent the wearing of coils and still provide adequate support.

The arrangement of the coil surface makes this heater extremely compact. There is no waste space within the shell and, although heater shells are of cast iron, the heaters in large sizes weigh less than steel shell heaters of equal capacity. The cast iron shell adds many years to the heater's life.



The improved Paracoil feed water heater shown in sectional elevation.

Three heaters are installed in the Pennsylvania. Two of these heaters operate parallel with low pressure steam in the shell. The third heater operates in series with the other two and receives steam at a higher pressure in the shell. Steam is bled from the turbines and is supplemented with exhaust steam from the auxiliaries.

The boiler feed water passes through the heater coils and is heated as closely as possible to the temperature of the steam in each heater. As the steam pressure is increased in the second stage heater, a much higher than ordinary boiler feed temperature is obtained. Boiler feed temperatures of 300 degrees are easily obtained by this method of heating. With a fuel saving of 1 per cent. for each 11 degrees temperature rise in feed water, a saving of over 18 per cent. of fuel results above a hot well temperature of 100 degrees Fahrenheit.

Paracoil evaporators are also installed. The plant of the Pennsylvania is capable of delivering 150 tons of distilled water per day. A cast iron shell and a hinged cast iron door form the main body. Manifolds of bronze are of the arc type bolted to the door in such manner that the entire heating element may be swung free from the interior for inspection or repair. No special handling tools are required as the door swings on outside hinges, which may be readily oiled and do not become clogged with salt scale. There are no integral rollers or tracks as on other devices which make evaporators difficult of access.

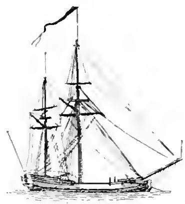
Vapor from the evaporators is let to the condenser for extra feed make-up and to the distillers for reserve storage water and drinking water supplies.

The distillers are also Paracoil equipment and are of the steel shell vertical, spiral coil type. The steel shells are provided with large doors to permit of easy access to the interiors. Coils are of copper, tinned to prevent contamination of the fresh water supply, and are suspended between manifolds.

An interesting fact about Paracoil equipment is the use of standard threads throughout. Ordinary pipe caps may be used for blanking off-coil connections. This is of importance to the operator faced by an emergency at sea.

Many years of experience in the design of marine equipment have impressed the engineers of the Davis Engineering Corporation with the importance of simplicity; and standards have been maintained throughout to the great advantage of the operator.

Paracoil clean steam generators on the Pennsylvania provide pure steam for galley cookers. Lubricating oil to the purifiers is heated in Paracoil oil heaters.



Hyde Steering Gear for U. S. Army Transport U.S. Grant

THE Hyde Windlass Company was awarded the contract for the steering gear for the U. S. Army transport U. S. Grant which is scheduled for extensive reconditioning in the near future.

This steering gear is of the hydro-electric type. It will have two hydraulic cylinders with 15-inch diameter rams directly connected to tiller on a 14-inch rudder stock. The rams are actuated by an electrically driven Waterbury pump. This pump is fitted with a control cylinder which prevents any overload on the motor due to sudden shocks on the rudder. The motor is a 25-horsepower drip-proof type and drives the pump continuously in one direction. This gear operates with a hydraulic pressure of 800 pounds per square inch at the hardover position.

A spare pumping set consisting of 25-horsepower motor and Waterbury pump will be furnished.

The gear is controlled from the pilot house by a Brown hydraulic telemotor. The stand in the pilot house is to have an extension shaft to a stand on top of the pilot house. There will be a trick wheel located in the steering room for operating the steering gear electrically should the telemotor fail. An extension shaft will be led from this trick wheel to a stand on the upper deck aft for emergency steering.

A further safeguard is to be installed in the form of a hand gear. Two 6-foot hand wheels will be located on the upper deck aft connected by a shafting and gears to a gear reduction stand in the steering room, this stand containing worm and open gearing connected through a quadrant bolted to the main tiller.

The Sperry steering control will be connected to the steering gear directly at the trick wheel stand for automatic steering.

The steering gear will be the latest development of the Hyde Windlass Co. and is the most efficient steering device obtainable. The Hyde Windlass Co. furnished similar gears of the 4-cylinder type for the California, Virginia, and Pennsylvania of the Panama Pacific Line.

C. V. Lane is the Pacific Coast representative of the Hyde Windlass Co. with offices at 1006 Balfour Building, San Francisco, and was instrumental in the placing of this order.

Trade Literature

Cooper-Bessemer Corporation, with headquarters in Mount Vernon, Ohio, has just issued a bulletin describing its new and greatly improved Cooper Type-80 gas engine compressor. This is a 19-page booklet printed in clear type on high grade coated paper — permitting clear illustrations of the various features of the design and workmanship embodied in Type-80 gas engines and compressors.

The Cargo Ship of Today. This is the title of a special publication in leaflet form just published by the **Westinghouse Electric & Manufacturing Co.** covering Westinghouse diesel-electric drive as applied to the Shipping Board freighters Triumph and Defiance in particular.

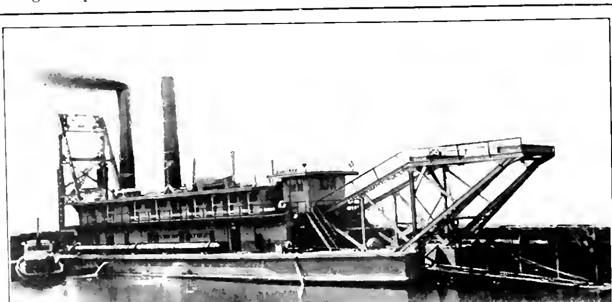
It has become increasingly apparent during the past two or three years that the day of the slow freighter is past. Shippers of ocean freight are now demanding speed in the transport of their merchandise, and ship owners are answering that demand with express cargo carriers of 13 to 15 knots.

This special publication contains, in addition to a complete description of the propelling and auxiliary machinery of the Triumph and Defiance, an analysis of the determining factors which led to the selection of diesel-electric drive for these ships. There is included a list of the Westinghouse Diesel electric marine installations, containing practically every type of merchant vessel, including yachts, ferries, dredges, tankers, tugs, towboats, cargo vessels, a fireboat, and a survey ship.

International Nickel Co., Inc., 67 Wall Street, New York, has published a leaflet on the subject of Nickel Cast Iron—Theory and Practice. This is a technical treatment of the subject and should be of interest to manufacturers using nickel cast iron. It is for free distribution.

Foster Valves is made the subject of a very fine catalog just issued by the **Foster Engineering Company** of Newark, New Jersey.

The Catalog, which is No. 60, contains about 100 pages of clear, concise descriptive matter and dimensions, graphs, diagrams, etc., of the line of valves and other engineering specialties carried by this company.



The new suction dredge Pittsburgh. This dredge hull, built of steel at the Staten Island plant of United Dry Docks, Inc., is 162 feet long, 44 feet wide, and 15 feet deep. The cutter ladder and most of the dredging machinery was removed from the old wooden dredge Pittsburgh and installed in this hull. Keel was laid in February and the dredge was turned over complete to her owners, the Atlantic, Gulf & Pacific Co., in August.

The Foster Engineering Company has been engaged in the business of supplying valves for almost half a century and the company has ever kept to the fore in its plant and equipment for modern practice in engineering. Copies of the catalog may be obtained on request.

The **Westinghouse Electric & Manufacturing Company** is distributing leaflet DMF-5182 entitled, **Modern Auxiliary Power and Lighting Equipment.** This describes the newest class of Westinghouse turbine-generator equipment for supplying auxiliary power for lighting and other purposes on shipboard. Besides general descriptive material, the folder contains approximate dimensions and weights of the units and a general description on heat balance arrangment. The leaflet is illustrated with several photographs of different sizes of turbine-generator units.

General Electric Company, Schenectady, N. Y., has issued a very attractive leaflet illustrating and describing **Textolite Laminated.** This product is composed of paper or cloth treated with synthetic resin and cured and compressed in powerful presses. Its properties are remarkable, according to the leaflet. Heat-resisting and infusible to the carbonization point, insoluble in practically all solvents, unaffected by hot or cold water, mechanically strong, an excellent dielectric, it is being used in the manufacture of a large number of machined and punched parts, such as rods, tubes, bars, and many special sizes and shapes.

General Electric Company has also the following new catalog sheets for distribution:

GEA-83A. Enclosed magnetic reversing switches for alternating current;

GEA-1157. G-E Strip heaters;

GEA-380-A. G-E Helicoil sheath-wire heating units;

GEA-1152. G-E Synchronous motors for pumping;

GEA-181B. A-c. Enclosed magnetic switches for alternating-current motors;

GEA-1150. G-E Electric heating Equipment for electrotype-metal furnaces;

GEA-104A. G-E Cartridge-t y p e electric heating units.

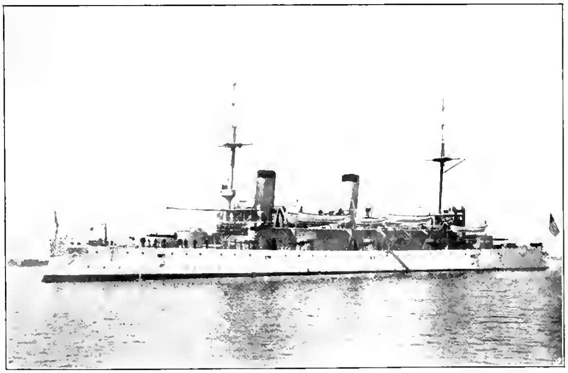
Grid-glow Demonstration Set is the title of Leaflet 20437, just released by the Westinghouse Electric & Manufacturing Company. This 4-page folder describes the novel demonstration set involving the grid-glow tube, which can be used to operate almost any type of display or exhibit that can be conceived. A wave of the hand over the grid-glow tube operates the relay which controls the operation of the apparatus being displayed. Some of the many applications of this advertising medium are starting electric fans, lighting electric lights, sounding electric bells, turning on radio receiving sets, and controlling show window lights and mechanical displays.

Illustrations of several of the applications of the grid-glow set are shown in the leaflet together with a wiring diagram of a typical installation. An explanation of the equipment and a table of weights and dimensions of the parts are included.

Few companies are able to dispense with the daily financial report and a current review of activities, and **Reports for Executive Control**, the latest publication of the Policyholders Service Bureau of the Metropolitain Life Insurance Company, describes the standard daily reports employed by fourteen prominent organizations representing a wide range of industry.

The study points out how progressive and outstanding companies have met the problem of executive control by supplying essential information in an attractive and easily assimilable manner. It is profusely illustrated with reproductions of forms and graphs used in this connection.

Copies of "Reports for Executive Control" may be secured by addressing the Policyholders Service Bureau, Metropolitan Life Insurance Company, One Madison Avenue, New York City.



The famous United States cruiser Olympia, pictured above, has been recently brought into the limelight on account of the proposal to scrap her along with several old ships of the navy. The Olympia was built at the Union Iron Works, San Francisco, and at her trials won the speed pennant for United States naval vessels at that time, and incidentally brought a handsome bonus to her builders. She was Dewey's flagship at Manila Bay, and a movement is now on foot to preserve her as a naval museum at Washington, D.C. Failing in this, it is rumored that her godmother, the City of Olympia, Washington, may secure her and preserve her as an attraction on the waterfront in the same way that Portland, Oregon, is taking care of that other Spanish War veteran, the battleship Oregon.

Trade Note

C. V. Lane, San Francisco, sales engineer for marine and industrial equipment, reports that he has arranged contracts with the U. S. Army Transport Service for equipment to be installed on the transport U. S. Grant as follows:

Hyde electric-hydraulic steering gear complete, as described in a separate article in this issue.

Two 14- by 14- by 18-inch vertical duplex lubricating oil transfer pumps manufactured by the Dean Brothers Company of Indianapolis.

Twelve double-frame and eight single-frame Welin mechanical davits for handling nested 28-foot Lundin lifeboats, together with complete equipment and accessories to enable all boats to be lowered simultaneously. This equipment includes 14 sets of Welin automatic chocks.

Organization and Trade Notes

De Laval-Bauer Wach Combination

THE De Laval Steam Turbine Company of Trenton, New Jersey, builders of geared steam turbines for numerous well-known vessels of the American merchant marine and navy, has taken a license to manufacture under the American Bauer-Wach patents.

These patents cover the use of exhaust turbines and gears to utilize the exhaust from reciprocating engines, thereby developing and transferring to the same shaft 20 to 25 per cent more power from heat otherwise wasted, as the turbine is more efficient at low pressures, and can use the greater volumes to which the steam expands under high vacuum.

The fuel consumption of present existing plants can be reduced from 20 to 25 per cent, or an increase of power obtained as high as 25 per cent.

This system also has the advantage that the turbine alone can propel the vessel at 60 per cent of full speed if the engine becomes disabled.

While the first installation of the Bauer-Wach system was made less than three years ago, it has been successfully applied up to the present time in over 135 vessels with a total horsepower of over 500,000. Dr. Gustav Bauer, whose name it bears, is the engineer responsible for the machinery of the North German Lloyd steamer Bremen, holder of all Atlantic records for speed.

Dr. Gustav Bauer, the inventor of the Bauer-Wach system of exhaust turbines and the designer of the geared turbine propulsion machinery for the North German Lloyd's Atlantic flyers Bremen and Europa.

San Francisco Branch of Chas. Cory & Son, Inc. Expanding into New Lines and New Quarters

The new home of Chas. Cory & Son, Inc., at San Francisco.

UNDER the efficient leadership of J. M. Lalor, Pacific Coast manager, the San Francisco branch of Chas. Cory & Son, Inc., has witnessed considerable expansion.

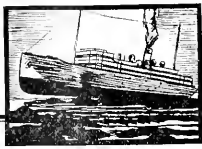
The offices, warehouse, and service bureau have recently been moved from No. 11 Mission Street to the new and commodious building at 224-232 Spear Street, shown in our illustration. Here Chas. Cory & Son will be in a position to give excellent service in spare parts, repairs, and new installations.

In the interests of building up a complete marine electrical service, the San Francisco branch of Chas. Cory & Son is taking on some additional lines as representatives of national manufacturers. In this connection Arley Cheadle, Pacific Coast manager of the marine department of the National Battery Company, manufacturers of custombuilt marine batteries, announces the appointment of Chas. Cory & Son, Inc., as San Francisco and northern California sales representatives.

This battery will be installed on the new palatial diesel yacht now building at the Long Beach yard of the Craig Shipbuilding Company for John Barrymore.

Custombuilt batteries are now handled in all major Pacific Coast ports by: Gordon & Belyea Co., Ltd., Vancouver, British Columbia; Electric Appliance Company, Bellingham; Sunde & d'Evers and the Marine Electric Shop, Seattle and Tacoma; Beebe & Co., Portland and Astoria; Marine Engineering and Supply Co., Wilmington; and Roger Clark Co., San Pedro.

J. M. Lalor, the efficient and popular manager of the San Francisco branch of Chas. Cory & Son, Inc.



Marine Insurance

Edited by JAMES A. QUINBY

Open Cargo Policies

Pacific Coast Shippers Ought to Take Advantage of the Contract Form of Coverage

> ### Second Thought
>
> Joe Goofus swipes my customers, Tom Eggers cuts my rates,
> Bill Judson says I stole his girl, but Bill prevaricates.
> And so I've built me up a set of vitriolic hates.
>
> I have written them some letters panning them and all their tribe,
> How I glory in those letters, in their biting thrust and jibe,
> They are models of invective—perfect gems of diatribe.
>
> I've written all those letters—but I'll tear them up tonight.
> The spoken word's forgotten when the speaker's out of sight,
> But men cannot forgive the things that other people write.
>
> J. A. Q.

DUE to the rapid expansion of carriage by water to and from Pacific Coast manufacturing and shipping firms during the past few years, there still exists a considerable number of shippers to whom the advantage of the open or contract form of policy is unknown. These shippers are familiar with other forms of insurance such as fire and life policies and often fall into the erroneous assumption that marine coverage must be specifically placed voyage by voyage. In the early days of ocean voyages, it was customary and even necessary that insurance upon water-borne goods be placed under voyage policies. Commerce had not acquired the status of a continuous performance and merchants of that day seldom had more than one or two cargoes afloat at the same time. As ocean transportation progressed, the identity of the particular shipment or particular voyage was merged in the general conduct of the business itself; so that today the average shipper is seldom in a position to tell the exact location of ocean shipments in which he is interested. He may know that a certain shipment left a certain point at a certain time, but as to the possibilities of transshipment or rail shipment he is totally in the dark, and if goods are returned to him or shipped from a foreign port for his account his knowledge of the details of the shipment is inadequate to enable him properly to place insurance bit by bit on the separate consignments.

To meet this situation and to afford owners a proper type of protection, marine underwriters have evolved the open or contract form of cargo policy. In this country, such a form of policy is a contract between the insurer and the assured whereby the latter agrees to declare each and every shipment which may move by water for his account, and the underwriter on his part agrees to hold such shipments covered against specified perils at a specified rate, even though the declarations may come in after the carrying vessel has arrived at destination or after damage has been ascertained. Under such a policy, the cargo owner may rest assured that he is covered against all contingencies named in the contract. If a foreign business connection ships him goods and fails to insure them or if a consignee of some of his previous shipments returns certain items without taking the trouble to cover them, he may declare such overlooked items under his open policy.

Duties of the Policy Holder

The fact that complete coverage is so easy under this convenient form of insurance should lead every Pacific Coast manufacturer or shipper to employ it. The benefits of the open policy are obvious, but the assured, in order to obtain these benefits, has the definite duty to perform his part of the contract; namely, to declare and pay a premium upon each and every shipment which may be at risk. The fact that no careful check is kept by underwriters on shipments made and received by their open policy holders leads many such policy holders to habits of carelessness. It is seldom that a reputable firm intentionally defrauds an underwriter by failing to declare goods which have arrived safely, but items are often overlooked by subordinates. If a shipment of goods arrives safely the shipping clerk or assistant traffic manager is tempted to save money for his firm and labor for himself by neglecting to declare it. Such practice is not only unfair to the underwriter but may vitiate the policy and deprive the assured of protection in case of serious loss. An underwriter who is able to show that his assured has repeatedly failed to declare shipments as required by the policy may well decline to pay a serious loss upon a shipment which is declared.

Every vessel upon which a general average is declared or whose manifest is subject to scrutiny for other reasons discloses numerous items of cargo which are uninsured. In the recent San Juan and Virginia cases, shipment after shipment consigned to or shipped by reputable concerns, who are known to have open policies, were not the subject of claim under those policies. The inference is obvious that such items are carelessly left uninsured and their owners, fearing the discovery of a continual practice in this connection, failed to make claim for the loss. Underwriting offices should make

a careful check of all cases in which the manifest of intercoastal or coastwise vessels comes to their attention and educate their clients to the necessity of living up to the conditions of their open policy.

The Come-on Game

"THE majority of men," said Mort Evans,"make a strenuous effort to be honest. I've been writing marine insurance for twenty years, and I've met my share of bunko men and bum risks—like that time the fellow put one trunk inside the other and claimed a loss, remember? But taking it by and large, the business is fairly honest."

"That is, so far as your customers are concerned." The second voice issued from a barricade of legal volumes kept on the edge of a desk to impress clients, and belonged to Dan Wheeler, the rotund, curly-haired admiralty attorney who had labored for years to attain the reputation of being the best-humored man on California Street.

"I mean so far as our business generally is concerned." The underwriter was serious. "People poke fun at your profession and mine—we are lampooned as grasping tricksters—when as a matter of fact, we probably run into less double-dealing than most people."

"Well, I don't know," said Wheeler, laying down the sport page he had been reading behind the ponderous cover of the Federal Code. "A flock of sure-thing deadbeats have tried to crash my gate. There was the bird who was going to put my name in 'Who's Who.' He got twenty-three dollars of the money I worked hard to earn from you, and now I learn that they've got him in jail, and there never was any book at all, and I'm faced with the knowledge that my name and picture will never shine forth among the elect. Think of it !"

"Yeah. They tried that one on me, too, but I didn't fall for it," said the underwriter dryly.

"And then there was the prosperous looking chap who called up, made an appointment, and sent in his card, last fall. Card read 'Josiah Evans.' Old stuff, of course. A relative of mine, and all that. Came from Cleveland, and his draft hadn't arrived, and could I cash a small check for him to tide him over the weekend. The worst of it was, he knew my real relatives, knew 'em literally like a book. I found out later that some fool had written a book about my family, and this bozo had probably learned it by heart. Anyway, I cashed his elastic check for ten dollars. As he went out the door, I said, 'By the way, what business are you in?' and he answered 'The steel business'—but he didn't spell it for me."

"But all those things are entirely aside and apart from your business," said Mort.

"I don't care." The lawyer ruffled his curly hair and threw up his nervous hands in a gesture of finality. "I'm through. I don't trust any of 'em. Do you know that lawyers predominate on every sucker list in the country and bankers come second? It's because of our trusting disposition. But never again for me,—I'm through."

The telephone at his elbow put a period to this declaration of independence, and Dan lifted the receiver.

"Who is it . . . Oh, a seaman, eh? . . . Well send him in." He turned to his visitor. "Don't go Mort. This bird probably won't take up much of my time. Seamen's cases are always good cases, you know. Sailors are wards of the Federal Court, and all that sort of thing. Far be it from little Danny to turn away a nice fat contingent fee."

The door opened, and a perfect type of the American seaman stood framed in the opening. Quietly, but uncomfortably dressed in his shore clothes, he shifted from one foot to the other, his patient brown eyes scrutinizing the faces of the men before him.

"Which is Mr. Wheeler, the lawyer?" he asked. Wheeler admitted the indictment.

"I was sent here by Captain Olsen," the man went on. "He told me you are a good lawyer and a friend of the sailor man."

"Oh yes," Wheeler waved the man to a chair, "And er, which Captain Olsen was it?"

"Captain Ole Olsen."

"Oh yes—ah—and which—But never mind. What can I do for you."

The man unfolded his story. He had signed on the Karney liner Noritta at Tampa, and upon reaching San Francisco had been kicked off the ship for no cause whatever, by a drunken master who refused to pay him his back wages. A perfect case for penalty recovery of double wages, if there ever was one.

"Have you any witnesses?" asked Dan.

"Yes sir." The man shifted his cap in his fingers. "The trouble is, my two shipmates who saw the whole thing went to their home in Eureka yesterday and I don't know where they'll go from there. Seafarin' men, you know—."

Wheeler was all action at once. "We must have them down here," he said. "We'll wire them to come down, and then we'll file suit and take their depositions, and—"

"But they can't get down here," said the sailor. "They haven't any money. You see, they were kicked off the ship too."

"What?" said Dan. "Two more cases? Well now, we'll have to see what can be done about this. How much would they need?"

A gleam came into the brown eyes of the sailor.

"Only about ten dollars," he said eagerly.

Just at this point Dan happened to glance at Mort Evans. The underwriter was watching proceedings with one eye half closed, and a cynical smile wrinkling the corners of his mouth. The lawyer shook his head suddenly, as if he had encountered a dash of spray. He sat down again, slowly.

"I'll tell you," he said. "It's almost lunchtime, and I have an appointment with Mr. Evans, here. Come in again at two o'clock, and we'll decide what's to be done."

The sailor's patient brown eyes took on a troubled look.

"My friends might leave Eureka today, sir," he said "I think it would be better to—"

"No," said Dan, "Two o'clock."

After the seaman left, Dan and Mort looked at each other. The underwriter broke the silence.

"Huh," he grunted, expressively "Never again."

"Oh, come now," said Dan, shifting uneasily, "You're too darn full of suspicions."

"Am I? Well, you'll do this much. Send a wire to the Shipping Commissioner at Tampa, and verify that this man signed on the Noritta."

Dan sent a wire to Tampa, and the friends went out to lunch. Upon their return, they found an answer from the Southern Shipping Commissioner, who was apparently somewhat of a character.

"Inquiry received," ran the wire, "Mike Marshall did not sign on vessel stop you are fifteenth lawyer ask this question."

"Gosh," said Dan. "I wonder how many didn't ask."

The underwriter made no answer. He was whistling quietly to himself the opening strains of "Barnacle Bill the Sailor."

Carrier Not Liable for Theft of Passengers' Belongings

UNDERWRITERS who issue coverage on tourists' personal belongings will be interested in the decision of the District Court in New York in the case of Dickinson vs. Munson Line, 33 Fed. (2nd) 329. It has ordinarily been assumed that a carrier is liable for theft from a stateroom in the same manner that a hotel keeper is liable for theft from a room. In the instant case, however, peculiar circumstances inclined the court to make an exception to the general rule.

Mr. and Mrs. Dickinson, passengers on the Munargo, occupied a stateroom opening on B deck. The usual notice was posted in the stateroom regarding the necessity of leaving valuables with the purser; but the court found that Mrs. Dickinson had a right to keep her watch with her in spite of such notice, since the watch was necessary to her personal convenience.

Mrs. Dickinson testified, however, that upon retiring she left her watch upon a dresser adjacent to an open window which faced directly upon B deck. Upon this state of fact, the court exonerated the carrier in the following language:

"Considering the above testimony it is clear that the steamship company furnished a dresser with a drawer in which Mrs. Dickinson was accustomed, when she took her watch off, to place it. She herself says: 'I would never have left my watch there (referring to the top of the dresser by the open window) had I been feeling alright.'

"It might as well have been placed upon the window sill.

"I fail to find therefore any proof of negligence on the part of the steamship company. It is equally plain that Mrs. Dickinson was careless and that such carelessness caused the opportunity for the theft.

"Assuming therefore that counsel for libelant has correctly stated the general rule as to a prima facie case, is it possible for libellant to recover for this loss where it is shown to be due to the carelessness of Mrs. Dickinson? I think not.

"The Supreme Court has stated in the case of Elcox vs. Hill, supra, 'It is settled by the authorities that where the loss is occasioned by the personal negligence of the guest himself, the liability of the innkeeper does not exist. Purvis vs. Coleman, 21 N.Y. 111; Cook v. Champlain Transportation Co., 1 Denio (N.Y.) 91.'"

Marine Study Class Opens Ninth Term

BEFORE a record-breaking crowd, the Marine Insurance Study Class sponsored by the Association of Marine Underwriters of San Francisco opened its ninth year of activity on Monday evening, October 7. This organization, originally formed for the exchange of ideas and mutual benefit of members of the allied

maritime trades, has developed into a fixed institution on California Street, and its fortnightly meetings, held fifteen times during the winter months, afford a clearing house for ideas among marine underwriters, attorneys, and steamship men of San Francisco.

The opening meeting was a particularly successful one due to the timely nature of the topic and the ability of the speaker. Golden W. Bell, prominent admiralty attorney of San Francisco, delivered a thorough and interesting treatise on the "Shipowner's Right to Limitation of Liability." Since the Los Alamos-Kentuckian, and the San Juan-S. C. T. Dodd collisions, the subject of limitation has become extremely important to marine underwriters, for the cargo underwriter faces, in limitation proceedings, a serious handicap upon his right to recover damages in full while hull underwriters on the limiting vessel achieve a benefit in that their liability is reduced.

Mr. Bell traced the history of the theory of limitation, pointing out that even before a shipowner was given a statutory right to limit his liability, the ancient maritime law allowed him a limitation to the value of the vessel predicated upon the theory that the vessel was liable as an entity as distinguished from the owner's liability. This theory was gradually recognized through maritime nations by the adoption of code provisions or statutes similar to the United States statute allowing a shipowner to limit liability to the value of his vessel after the accident and the British statute allowing limitation to an arbitrary sum per ton as the vessel existed prior to the accident.

The speaker further pointed out that the chief difficulty in establishing the owner's right to this privilege generally arises from his obligation to show that he was not personally involved in the cause of the loss.

Book Reviews

THE SHIPPING WORLD. By John A. Todd, M.A., B.L. 290 pages with numerous diagrams, drawings, and tables. Crown 8 vo. cloth; published by Isaac Pitnam and Sons, New York. Price $2.25 net.

This handy volume is a compilation of the substance of lectures delivered in the courses on Shipping at the City School of Commerce, Liverpool. It is well arranged, ably edited, and adequately indexed by John A. Todd, the principal of the school.

Five sections subdivide the text. These are named, I, Ships and their uses; II, Ship operating; III, Traffic; IV, Organization, V, Ports. The five sections are further subdivided into chapters, seventeen in all, and each chapter is the work of one or more practical experts in the particular subject in hand. Naturally these experts are all British and the book should, for that reason, be particularly valuable to American students of shipping, as it gives a very clear statement of the principles underlying the organization of British shipping and British ship operating companies.

Each chapter is reinforced by a special subject bibliography.

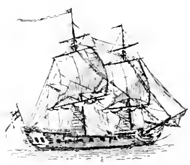
Altogether, this is the best text book for a practical course in shipping that has yet come to our notice. Every young man interested in modern shipping should own a copy of this book.

TIDE TABLES for the world for the calendar year 1930 are contained in **Serial 439**, a book of 480 pages just published and being sold for 75 cents a copy by the U. S. Coast and Geodetic Survey, Washington, D.C.

This volume contains full predictions for every day in the 1930 calendar year for 89 of the principal ports of the world and differences and constants for more than 3500 subordinate tide stations, so that the navigator may predict the times of high and low waters at practically any port. In addition to several auxiliary tables to facilitate tidal computations, it includes tables of sunrise and sunset, moonrise and moonset, and a table of the moon's phases, apogee, perigee, and greatest north, south and zero declination.

Special editions are also issued, reprinted from this publication, known as **Tide Tables** for the **Atlantic Coast** (15 cents), **Pacific Coast** (15 cents), **New York Harbor and Vicinity** (5 cents), and **Boston Harbor and Vicinity** (5 cents).

This Bureau of the Department of Commerce has also issued **Special Publication No. 152** (25 cents), containing graphic tidal current charts for New York harbor, showing the direction and strength of the current throughout that harbor for each hour of the day, to enable the navigator to take advantage of favorable currents.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Panama Mail Line Seeks Mail Contract

The Panama Mail Steamship Company of San Francisco is seeking a mail contract from the Postoffice Department to assist in the development of its trade route between San Francisco and New York by way of the Panama Canal to ports of Central and South America. Edward T. Ford, president, and Daulton Mann, general manager, are now in the East negotiating for the mail contracts and for a loan from the Shipping Board construction loan fund. The company plans the construction of several 18-knot combination passenger and freight vessels for this service.

Bids Asked On De Luxe Liners

American Shipyards have been invited by the United States Lines, Inc., 45 Broadway, New York, to submit bids by November 15 for the construction of two passenger and freight liners, the largest ever to be ordered by an American company. The bids will be submitted with the understanding that the vessels will be built only on condition of receipt of a mail contract and construction loan from the government under the terms of the Jones-White Shipping Act.

The vessels are to be 705 feet long, 82 feet beam, 30 feet draft. The vessels will have twin screws and will be powered by turbines and single reduction gears; but alternate bids on electric drive prime movers may be submitted. The specified speed is 22 knots.

The liners will have accommodations in all for 1300 passengers in first class, tourist class, and third class, and the first cabin accommodations will have all the latest furnishings and equipment embodied in modern Atlantic passenger liners.

The shipyards which will bid on the work of these vessels are the Bethlehem Shipbuilding Corporation, Newport News Shipbuilding Co., and New York Shipbuilding Company, all of which have contributed the services of their chief engineers and naval architects in preparing the plans and specifications.

Bids Submitted on Survey Tender

Bids were opened October 9 at the Washington office of the U. S. Coast & Geodetic Survey for the construction of a steel, diesel-propelled, survey tender. The boat is to be 77 ft. 6 ins. over-all, 15 ft. 6 in. beam molded; 10 ft. 3 in. depth; 5 ft. 10 in. loaded draft. The main propelling engine is to develop about 110 horsepower. Bids submitted were:

Bidder	Engine		Plate rudder	Oertz rudder
Leatham D. Smith, Sturgeon Bay, Wis.	Atlas-Imperial	(140)	57,000	57,500
	Winton	(130)	57,000	57,500
Albina Marine Iron Works, Portland, Ore.	Atlas-Imperial	(140)	57,600	
Chas. Ward Engineering Works, Charleston, W. Va.	Atlas-Imperial	(140)	$61,320	$61,820
	Winton	(130)	61,830	62,330
	Atlas-Imperial	(120)	60,240	60,740
	Worthington	(120)	62,080	62,580
General Eng. & D D Co., San Francisco	Winton		69,140	69,715
Nashville Bridge Co.	Standard		70,000	70,600
	Winton		67,850	68,350
	Bessemer		72,000	72,600
	Worthington		67,000	67,600
Lake Washington Shipyards	Standard		83,700	
Electric Boat Corp.	Incomplete		102,740	
Charleston D D. & Mach. Co.	Incomplete		117,095.78	117,295.78

Bids To Be Called For Additional Work on Transport U. S. Grant

Bids will be opened in about ten days at the office of the U. S. Army Transport Service, Fort Mason, San Francisco, for further improvements to the transport U. S. Grant, used in the San Francisco-Manila service. Considerable work was done on this vessel early in 1928 at the Mare Island Navy Yard; but at that time sufficient funds were not available for all the work planned by the Transport Service and the Mare Island Navy Yard, which aided in preparation of specifications and the installation of equipment.

The work now to be done will cost in the neighborhood of $200,000. It will consist largely of the installation of modern equipment in the engine room and other parts of the vessel and the improvement of officer and troop quarters.

When completed, this work will put the transport U. S. Grant in first-class condition for peace-time or war-time service. Mr. Thompson is chief engineer of the Transport Service, San Francisco.

United Fruit Company Is Planning Construction Program

The United Fruit Company, with headquarters at Boston, Mass., and operating passenger and freight service in its trade between ports of South and Central America and the West Indies and the Atlantic and Pacific Coasts, is reported to be preparing plans for the construction of from four to nine vessels in American shipyards. This company has applied for a contract to carry mails from New York to South America, although no definite action has been taken on this by the Postoffice Department.

Standard Shipping Company To Order Tankers

The Standard Shipping Company, 26 Broadway, New York, are negotiating with an Atlantic Coast and a Pacific Coast shipyard for the construction of ten 15,000-ton oil tankers, for which definite orders may be placed in thirty days, providing favorable cost agreements may be made.

Bids Opened for Seattle Ferryboats

Bids were opened October 16 at the office of the Kitsap County Transportation Co., Seattle, Captain

John L. Anderson, president, for the construction of two ferryboats for Puget Sound service. Bids were submitted on both wood and steel construction, as follows:

	Wood	S eel
Todd Dry Docks, Inc.	$148,000	$189,000
Lake Washington Shipyards	107,500	159,500
Winslow Marine Railway....	111,900	185,000
Johnson Shipbuilding Co.	116,000	
Ballard Marine Railway	96,600	
Skansie Shipbuilding Co.......	89,750	

Separate bids were submitted for furnishing 800-1000 horsepower diesel engines, the companies bidding being the Washington Iron Works, New London Ship & Engine Co., Atlas-Imperial Engine Co., and McIntosh & Seymour.

The boats are to be 200 feet long, 57 feet beam, 16 feet depth. They are to be powered with diesel engines capable of giving a speed of 12 knots, and are to carry automobiles and foot passengers. The specifications call for special type of seats as installed on the Key System ferries on San Francisco Bay, and for refrigerator in the fountain service.

Bids Submitted On Oil Tankers and Barges

The Sinclair Navigation Co., 45 Nassau Street, New York, opened bids September 16 for construction of two steam turbine tankers and two diesel-powered tank barges. The tank steamers are to be 416 feet between perpendiculars, 57 feet beam, 24 feet draft. They will have steam turbines and Babcock & Wilcox boilers developing 4000 shaft horsepower through double reduction gears. The barges will be of 5000 and 2500 barrels capacity.

Atlantic Coastwise Vessel Planned

Theodore E. Ferris, 30 Church Street, New York, is reported to be preparing plans and specifications for a passenger and freight vessel for the Old Dominion Line.

Lake-Tanker Contract to be Awarded

Bids were opened by the Standard Oil Co. (Ind.), of Chicago, on September 19 for the construction of a 400-foot steel steam tanker for Great Lakes service.

Fleet of Barges Planned By Canadians

The Canada Steamship Lines, Ltd., of Montreal, may build a fleet of eight light, steel barges propelled by diesel engines to carry grain from the new terminal at Kingston, to ocean vessels at Montreal. Order for the first barge has been placed with the Davie Shipbuilding Co. at Lauzon, Quebec, and it is 252 feet long, 43 feet beam, 14 feet draft. After try out of this barge, decision will be made as to the construction of additional barges.

New Ferryboat for New York

The Department of Plant and Structure of the City of New York will build a 106-foot, single-end, ferryboat to accommodate 300 passengers. Power plant to have steam engines and Scotch marine boiler.

Building of New Fireboats Urged

After a survey of the conditions of the Vancouver, British Columbia, waterfront and its fire protection facilities, the British Columbia Insurance Underwriters' Association recommends the addition of two fireboats to the city's fire protection apparatus, one to be located at the foot of Carrall Street and the other at Victoria Drive.

Acting Fire Chief Brennan of San Francisco has also indicated his intention of proposing to the city's Board of Supervisors the necessity of constructing modern fire fighting boats to replace the steam vessels now being operated by the city on the waterfront.

The City of Oakland, under its extensive harbor development program, will soon prepare plans for the construction of an adequate fireboat for the protection of its new terminals. An item for this purpose was included in the harbor bond issue of $10,000,000.

New Cutter Planned

Bids will be opened at the office of the U.S. Coast Guard, Washington, D.C., on November 5 for the construction of a new cutter similar to the three recently completed by Bethlehem Shipbuilding Corporation and to the three now under construction at the General Engineering & Drydock Co., Oakland, Calif. These cutters are 250 feet long, 42 feet beam, 15 feet depth, and are to be powered by Westinghouse turbines and motors developing 3000 shaft horsepower.

SOME RECENT SHIPBUILDING CONTRACTS

Loan Awarded for Construction of Matson Ships

Bethlehem Shipbuilding Corp. Fore River Plant, Quincy, Mass., will build the first two liners for the San Francisco-Australia service of the Oceanic Steamship Company of San Francisco, a subsidiary of the Matson Navigation Company. A loan of $11,700,000 has just been approved by the Shipping Board under the terms of the Merchant Marine Act of 1928.

The vessels will be 632 feet long, 79 feet beam, and will have accommodations for 752 passengers; 505 first-class, 175 second, and 72 steerage. The vessels will have twin screws and will be propelled by single reduction gear turbines developing a cruising speed of 20 knots. They will be of 11,300 D.W.T. and will cost $7,400,000 each.

Sun Shipbuilding & Drydock Company, Chester, Penn., has an order from the Tide Water Associated Transport Corp. of New York for two steel single-screw, diesel tankers of 13,450 D.W.T.

The Pusey & Jones Corp., Wilmington, Del., has order from the Tide Water Oil Co. of New York for an oil tanker 255 feet between perpendiculars, 44 feet beam, 15 ft. 6 in. loaded draft; to have diesel-electric propulsion plant of 1250 I.H.P.

Collingwood Shipyards, Ltd., Collingwood, Ontario, has received an order from the Canadian Govt. Dept. of Public Works, Ottawa, for two seagoing tugs to be 94 ft. long, 23 ft. 6 in. beam, 10 ft. 6 in. loaded draft aft, 8 ft. 6 in. forward; power plant to consist of compound steam engines developing 500 horsepower; one Scotch marine boiler 13 ft. 9 in. diameter.

Howard Shipyards & Dock Co., Jeffersonville, Ind., has an order for two steam towboats from the Vesta Coal Co. of Pittsburgh; to be 139 ft. 6 in. long, 34 ft. beam, 7 ft. 4½ in. depth molded; compound condensing engines; one water-tube boiler, 42 in. dia.; Foster-Wheeler "Nelis" steam generator.

Consolidated Shipbuilding Co., Morris Heights, N.Y., has an order for an 80-ft. cruiser for G. F. Breen; to be powered by 2 Winton engines.

Dravo Contracting Co., Pittsburgh, has an order from the Stan-

dard Unit Nav. Co. for two steel, twin tunnel steam towboats of 200 ft. length.

Midland Barge Company, Midland, Pa., has an order for a hopper barge for Parsons & Rader Transp. Co., 100 by 24 by 6 ft. 6 in.; also an order for a mooring barge for Cougar-Korsmo Const. Co., 200 by 15 by 4 ft.

New York Shipbuilding Co., has an order for a barge for the Hercules Cement Corp., 200 by 34 by 9 ft. 6 in.

Bethlehem Shipbuilding Corp., Ltd., Fore River Plant, Quincy, Mass., has an order from the Atlantic, Gulf & West Indies Steamship Company, 25 Broadway, New York, for a passenger vessel for the New York & Port Rico Steamship Line, a subsidiary, to be operated in the New York and Port Rico-San Domingo service.

The vessel was designed by Theodore E. Ferris, 30 Church Street, New York, and will be somewhat similar to the Coamo but embodying many improvements.

Parke & Kibele, San Pedro, Calif., have received as their first new ship construction job an order for a three-purpose workboat for John Gabelich. An active part in the financing of this vessel was taken by Charles L. Houghton of San Pedro.

The boat will be 90 feet long and will be fitted to serve as a bait or purse seiner, or as a towboat, as the demand warrants. She will be of heavy wood construction and will be powered by a 325-horsepower diesel engine.

Los Angeles Shipbuilding & Drydock Co., San Pedro, Calif., has received an order from the Union Oil Company of California, Los Angeles, for a 3000-barrel bulk oil barge for Los Angeles harbor service.

The barge will be 110 ft. over-all; 36 ft. beam; 8 ft. 6 in. molded depth; equipped with two herringbone geared, independent pumping units located aft. Albert O. Pegg is marine superintendent of the oil company. The barge will cost about $55,000.

New Fishing Boats Ordered

Harbor Boat Building Company, San Pedro, Calif., has an order for a 102-ft. bait boat for K. Cesareo, who fishes for the Van Camp Sea Food Co. The boat will be powered with a 350-horsepower Atlas-Imperial diesel engine and auxiliary power will come from a 35-horsepower Atlas-Imperial diesel. A 5-ton York refrigerating unit will be installed. The boat will cost about $70,000.

This yard has just booked an order for a 62-ft. Union diesel engine powered cruiser for Dr. F. W. Schefick of Minneapolis; designed by D. M. Callis.

Al Larson, Terminal Island, San Pedro, Calif., has received an order for a 115-ft. refrigerated bait boat for Messrs. Ido, Ishi, and Shindo, San Pedro fishermen; power plant to be 450 horsepower diesel.

San Pedro Boat Building Co. has an order for a 102-ft., 375-horsepower diesel powered refrigerated bait boat for Andrew Zambarlin.

Bethlehem Shipbuilding Corp., Ltd., San Francisco, has order from Merritt, Chapman & Scott Corp. of New York, for a derrick barge for San Pedro harbor; 125 length; lifting capacity 90 tons.

Defoe Boat & Motor Works, Bay City, Michigan, has received an order from Isadore Zellerbach of San Francisco for a 143-foot yacht to cost about $250,000. The vessel is to be of all steel construction, 23.6 feet beam, 9 ft. draft, and is to be powered with two 350-horsepower diesel engines. The yacht will have five suites of rooms besides those of the owner, and is to carry three power launches.

NEWS FROM THE SHIPYARDS

Firms Consolidate for Shipbuilding

Merger of the Johnson Shipyards of Port Blakely, Washington, and the McAteer Shipbuilding Company of Seattle and the organization of the Johnson Shipbuilding Company to occupy the site of the McAteer shipyard has been announced by George H. McAteer. The company will be incorporated with an authorized capital stock of $50,000 and will engage in the building of ferryboats, scows, and small craft of every description. The J. C. Johnson Shipyard at Port Blakely was organized in 1918 and has turned out many of the smaller craft now in use in Puget Sound and Alaska waters. The McAteer concern dates back to 1914.

New Ship Concern

A holding concern of Seattle capitalists has acquired 53 per cent. of the stock of the Puget Sound Navigation Company, operating 23 vessels on ferry and freight routes on Puget Sound. W. B. Foshay Co. owns 26 per cent. of the stock of the Puget Sound Navigation Company. E. T. Stannard of Seattle heads the new ship holding company and it is reported a stockholders meeting will be called November 14 for election of offices.

Sells Vessels For Scrapping

The United States Shipping Board has accepted the bid of the Union Shipbuilding Company of Baltimore for $335,000 for 22 laid-up vessels to be scrapped. With the exception of two, these vessels are laid up at Norfolk and New York.

United States Lines Appoints Perrott On Construction Program

William Perrott, for several years operating manager of the United States Lines, 45 Broadway, New York, has been appointed Manager of Construction to supervise the ship construction program outlined by the company.

It is rumored that the United States Lines may take over the old Cramp Shipyard at Philadelphia for the construction of new tonnage planned by this company. The report follows a visit to Philadelphia of Joseph E. Sheed, executive vice-president, and William Perrott.

It is reported that the new Dollar liners, for which order has beeu placed with the New York Shipbuilding Company, will be equipped with airplane facilities for the fast delivery of mail and for aerial sightseeing trips by passengers in the round-the-world service.

KEEL LAYINGS

Steel carfloat for Atchison, Topeka & Sante Fe Ry. by Lake Washington Shipyards, Oct. 2.

Four wooden scows, by Prince Rupert Drydock & Shipyard, Oct. 23 and 15.

Steamship for Pittsburgh Steamship Co. by Great Lakes Engineering Works, Sept. 15.

Two cargo and oil barges for American Barge Line Co. by Howard Shipyards and Dock Co., Sept. 13, Oct. 3.

Single-screw diesel tanker for Motor Tankship Co., by Sun Shipbuilding Co., Sept. 12.

LAUNCHINGS

Westdahl, survey tender for U.S. Coast and Geodetic Survey by Albina Marine Iron Works, Sept. 12.

No. 115, diesel-electric lightship for U.S. Lighthouse Bureau by Charleston Drydock and Machinery Co., Aug. 20.

Two combination cargo and oil barges for American Barge Line Co. by Howard Shipyards and Dock Co., Sept. 10 and 28.

Five steel barges for N.Y. State Canal Comm. by Midland Barge Co., in October.

Stadacona, bulk freighter for Canada Steamship Lines, Ltd., by Midland Shipbuilding Co., Ltd., Midland, Ont., Sept. 26.

Rene, yacht for Alfred P. Sloan, Jr., New York, by Newport News Shipbuilding Co., Sept. 19.

Cambriona, yacht for owner not named, Oct. 7.

Argos, steel patrol vessel for New York Harbor by Spedden Shipbuilding Co., Sept. 5.

City of New York, passenger and freight motorship for American South African Line, Inc., New York, by Sun Shipbuilding Co., Oct. 19.

Socony 23, tug for Standard Shipping Co. by United Dry Docks, Inc., Sept. 19.

DELIVERIES

Steel barge for Atlantic Transport Co. by Bethlehem Shipbuilding Corp., Baltimore.

Steel oil barge to Atlantic, Gulf & Pacific Co. by Dravo Contracting Co.; deck scow to New York Central R.R.; steel floating dry-dock to Warner Co.; 3 standard barges; dump scow to G. H. Breymann and Bros.; 3 barges to Arundel Corp., in Oct.

Scow to Candler Dock & Dredge Co. by Great Lakes Eng. Works, Sept. 19.

Track barge to Yourtel-Roberts Sand Co. by Howard Shipyards and Dock Co., Sept. 25.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of October 1, 1929.

Pacific Coast

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length over-all; 30' beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28; launched 6/17/29; deliver 10/15/29 est.

Hull No 113, lightship, sister to above; keel Sept. 1/28; launched 7/2/29; deliver 11/30/29 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

Westdahl, survey tender for the U.S. Coast and Geodetic Survey; 77'6" long; 15'6" beam; 10'3" depth; keel 7/6/29; launched 9/12/29; deliver 11/1/29 est.

One steel barge for Western Transp. Co.; 130 ft. length; keel 10/7/29 est.

BALLARD MARINE RAILWAY COMPANY
Seattle, Washington.

Penquin, hull J-97, patrol boat for U. S. Bureau of Fisheries, Seattle; 130 L.B.P.; 27 beam; Union diesel eng.; deliver January/30.

CRAIG SHIPBUILDING CO.,
Long Beach, Calif.

Purchasing Agent: F. W. Philpot.

Not named, hull 151, yacht for John Barrymore, Los Angeles; 118 L.B.P.; 21 beam; 9 loaded draft; 13 knots speed; 2 275-H.P. Atlas-Imperial diesel engs.; keel Sept. 15/29 est.; deliver Jan./30 est.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A Wanner.

Itasca, No. 21, diesel-electric cutter for U.S. Coast Guard; 250x42x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.; keel 6/15/29; launch 11/1/29 est.

Sebago, No. 22, same as above; keel 6/15/29.

Saranac, No. 23, same as above.

J. C. JOHNSON'S SHIPYARD
Port Blakley, Wash.

Two scows for stock, 110x36x9.

LAKE WASHINGTON SHIPYARDS,
Houghton, Wn.

Purchasing Agent: A. R. Van Sant.

Foshay, hull 107, steel passenger and freight motorship for Northland Transportation Co., Seattle; 186x35 ft. beam; two 550-H.P. Washington-Estep diesel engs.; keel Mar. 4/29; launched July 27/29; deliver Sept. 15/29 est.

No name, hull 109, cruiser for Stewart Edward White, Hillsborough, Calif.; 75 ft. length; 110 H.P. Washington-Estep diesel eng.; deliver 5/1/30 est.

THE MOORE DRY DOCK CO.
Oakland, Calif.

Hull 179, steel carfloat for Atchison, Topeka & Santa Fe Ry. Co.; 260 L.B.P.; 38 beam; 7'6" draft; 1000 D.W.T.; keel 10/2/29; launch 12/20/29 est.; deliver 1/11/30 est.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

Purchasing Agent: Wm. H. L. Taylor.

Ispaco II., hull 30, pilchard seine boat for Island Packing Co., Victoria, B.C.; 65 L.O.A.; 17'5" beam; 7'8" depth; 75-H P. Atlas-Imperial diesel eng.; keel Mar. 15/29. launched June 7/29; delivered June 21/29.

Unnamed, hull 31, steel tug for Canadian National Railways; 71'6"x17'x9'6"; 300 B.H P. diesel eng.; keel 10/15/29 est.

Hull 32, steel car barge for Canadian National Railways, 184 x 40 x abt. 5 ft.; cap. 8 loaded cars; keel 10/30/29 est.

Hulls 31 and 32 to be fabricated at yard; then shipped to Kelorona on Okanogan Lake for completion.

Hulls 33 to 36, inc., four wooden scows, 110 x 38 x 9'8"; keels (2) 9/23/29; (2) 10/15/29 est.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement, keel July 4/28; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty-four cargo barges for Inland Waterways Corp.; 230x45x11 ft.; 13 delivered.

Six sand and gravel barges for Rodgers Sand Co., 135 x 27 x 7'6".

One towboat hull for Carnegie Steel Co.; 149 x 34 x 6 ft.

BATH IRON WORKS
Bath, Maine

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer; keel Dec. 3/28; launch Apr. 10/29 est.; deliver May 1/29 est.

Corsair, hull 124, twin screw steel steam turbo-electric yacht; 343x42x27ft., 18 ft. draft; 6000 S.H.P.; General Electric turbo-generators; Babcock & Wilcox boilers; keel June 11/29; launch Jan. /30 est.

Ebb, hull 126, fishing trawler for Bay State Fishing Co., Boston, Mass., Bath Iron Works design; 132'4" L.O.A.; 121'6" L.W.L.; 24 beam; 13 depth; 500-600 B.H.P. Winton diesel engs.; keel 6/18/29; launch Nov. /30 est.

Flow, hull 127, sister to above; keel 6/18/29; launch No. /30 est.

Malaina, hull 128, steel yacht; B. T. Dobson, designer; owner not named; 168 L.B.P.; 26 beam; 9 draft; twin Winton diesel engs.; 1600 I.H P.; keel Dec. 5/29 est.

Notre Dame, hull 129, trawler for A. & P. Fish Co., Boston; 116 I H.P.; 23 beam; 11 loaded draft; single screw; 500 I.H.P. Bessemer diesel eng.; keel 6/18/29; launch Nov. /30 est.

Fordham, hull 130, trawler; sister to above; keel 6/18/29; launch Nov. /30 est.

Unnamed, hull 131, steel aux. schr. yacht; Henry J. Gielow, designer; owner not named; 150 L.B P.; 32 beam; single screw; 300 I.H P. Bessemer diesel eng.; keel 10/1/29 est.

Not named, hull 132, twin screw diesel yacht for Henry J. Gielow, designer; 105 L.O.A.; 2 200-H.P. Bessemer diesels.

Not named, hull 133, twin screw diesel yacht; B. T. Dobson, designer; 125 L.O.A.; 2 400-H P. Winton diesels.

Unnamed, hull 134, steel yacht, owner not named; 190 L.O.A.; 154 L.W.L.; 26 beam; two 800 B.H.P. Bessemer diesels; keel Nov. /29 est.

Unnamed, hull 135, same as above.
Unnamed, hull 136, same as above.
Unnamed, hull 137, same as above.
Unnamed, hull 138, same as above.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Northampton, light cruiser CL-26, for United States Navy; 10,000 tons displacement; launch Sept. 7/29 est.

Berwindvale, Hull 1422, single-screw coal collier for Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers; launched June 8/29.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Hull 1425, steel coasting vessel for Seaboard Shipping Co.; 450 gr. tons; launched

May 29/29.

Hull 1426, steel barge for Gulf Refining Co.

Not named, hull 1427, steel trawler for R. O'Brien & Co., Inc., Boston.

Not named, hull 1428, same as above.

Not named, hull 1429, same as above.

Cities Service No. 4, hull 1431, steel barge for Cities Service Ref. Co., New York; 200x36x12 ft.; 12,000 bbls. oil capacity.

Hulls 6139-40, two steel barges for Western Maryland Ry. Co., 499 Gr. T. ea.; **one delivered.**

BETHLEHEM SHIPBUILDING CORP., LTD.,
Baltimore, Md.

Hulls 4252-54, three steel barges for Atlantic Transport Co.; 700 gr. tons each; **one delivered.**

Hull 4255, steel carfloat for Central R.R. of N J.; 900 gr. tons.

Hulls 4256-4265, 10 steel carfloats for Baltimore & Ohio R.R. Co.; 872 gr. tons each.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; Winton engs.; General Electric generators and motors; keel Jan. 30/29; **launched 8/30/29.**

No. 116 same as above; keel Feb. 6/29; launch 10/22/29 est.

No. 117, same as above; keel May 1/29; launch Dec. 1/29 est.

One all-welded tanker for stock; launch 11/29 est.

One all-welded tanker.

Not named, steel survey boat for the U.S. Engineers Dept., Philadelphia.

COLLINGWOOD SHIPYARDS, Ltd.
Collingwood, Ontario.

Purchasing Agent. E. Podmore.

No name, hull 83, tug for Toronto Harbor Comm.; 100 x 25 x 12'6"; 11 loaded speed: T.E. engs. 1000 I.H.P.; Scotch boilers, 195 lbs. press.; keel July 25/29.

Hull 84, seagoing tug for Canadian Govt., Dept. Pub. Works; 94 L.B.P.; 23'6" beam; 10'6" loaded draft aft; 8'6" loaded draft forward; comp. eng. 500 I.H.P.; 1 Scotch marine boiler 13'9" diam.

Hull 85, sister to above.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2940, 154-ft. cruiser for Anson W. Hard, of New York City; 2 Winton diesel engines.

Hull 2942, 24-ft. coupe yacht tender for above; 1 Chrysler engine.

Hulls 2944, 2945, and 2946, three 30-ft. coupe yacht tenders for yachts now building at Pusey & Jones; 106 H.P. Chrysler engines.

Hulls 2947, 2948, and 2949, three 26-ft. open crews' launches for yachts now building at Pusey & Jones; 65 H.P. Chrysler engines.

Hulls 2950 and 2951, two 20-ft. crew's tenders for yachts now building at Pusey & Jones; 12 H.P. Kermath engines.

Hulls 2952, 2953, and 2954, three 24-ft. life boats for yachts now building at Pusey & Jones.

Hull 2957, 75-ft. cruiser for E. F. Clark, Youngstown, Ohio; 2 300-H.P. Speedway engines.

Hull 2960, 135-ft. steel diesel yacht for a prominent New York yachtsman; 2 600 H P Treiber diesel engines.

Hull 2961, 75-ft. cruiser for Jeremiah Milbank of New York City; 2 Winton engines.

Hull 2962, 80-ft. cruiser for J. T. McMillan, Detroit, 2 300 H.P. Speedway engines.

Hull 2963, 50-foot cruiser for A. E. Walbridge of New York City; 1 Sterling engine.

Hull 2964, 75-ft. cruiser for G. M. Moffett of New York City; 2 Winton engines.

Hull 2965, 70-ft. commuter boat for D. W. Dilworth of New York City; 2 300-H.P. Speedway engines.

Hull 2966, 80ft. cruiser for G. F. Breen; 2 Winton engs.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W. E. Whitehouse.

Olive K., hull 133, steel yacht for C. F. Kettering, Detroit; 169 L.B.P.; 26 **beam;** 12 loaded draft; 15 knots speed; 600 D W.T.; 1000 I.H P. diesel engs.; keel Jan. 15/29; **launched 9/5/29;** deliver 10/1/29 est.

Not named, hull 136, steel yacht for A. V. Davis, New York; 138'6" L.B.P.; 18 beam; 5 loaded draft; 20 M.P H.; 150 D.W.T.; 1400 I.H.P. diesel engs.; **keel July 15/29;** launch Oct. 1/29 est.; deliver Apr. 15/30 est.

Marnell, hull 137, steel yacht for M. H. Alworth, Duluth; 135 L.B.P.; 22 beam; 6'9" draft; 14 M.P.H.; 175 D.W.T.; 600 I H.P. diesel engs.; keel Apr. 15/29; launch Oct. 15/29 est.; deliver Nov. 1/29 est.

Not named, hull 138, steel yacht, owner not named; 153 L.B.P.; 24 beam; 9'6" loaded draft; 15 M.P.H.; 450 D.W.T.; 1000 I.H P. diesel eng.

Not named, hull 139, steel yacht for Thos. M. Howell, New York City; 160 L B P; 24'6" beam; 8 loaded draft; 17 M.P.H.; 500 D.W.T.; 1300 I.H.P. diesel eng.

DRAVO CONTRACTING COMPANY,
Pittsburg, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'6" x 26'6" x 5' 6".

Hulls 844-855 incl., 12 standard sand and gravel barges for stock; 100x26x6'6"; **8 delivered.**

Hull 856, steel oil barge for Atlantic, Gulf & Pacific Co.

Hulls 899-906 incl., 8 sand and gravel barges for Keystone Sand & Gravel Co.; 135x27x8'; **4 delivered.**

Hull 908, 909, two steel hull whirler derrick boats for U. S. Engineers Office, Memphis.

Hulls 910-913 inc., four steel grain barges for Western Stevedoring Co., 130x 30x16'6".

Hull 916, steel hull floating grain elevator for Western Stevedoring Co.

Hulls 826-829 incl., 4 dump scows for Geo. H. Breymann & Bros.; 1500 cu. yd. capacity; **1 delivered.**

Hulls 886-892 incl., 7 steel sand and gravel barges for Arundel Corp.; 130x34x9 ft.; **3 delivered.**

Hulls 917-922 incl., 6 standard sand and gravel barges for stock; 130x30x7'6".

Hulls 923-928 incl., 6 standard sand and gravel barges for stock; 100 x 26 x 8'6".

Hull 929, ladder type sand and gravel dredge for stock.

Hulls 930-949 incl. 20 steel hopper coal barges for Davison Coke and Iron Co.; 175x26x11 ft.

Hulls 960-961, two 200-ft. steel, twin tunnel, steam towboats for Standard Unit Nav. Co.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent. R. S. Page

Hull 111, steel welded barge for O'Brien Bros.; 120 x 36 ft.; 1200 D.W.T.

Hull 112, barge for Venezuela Gulf Oil Co.; 80 x 24 x 6 ft.

GREAT LAKES ENGINEERING WORKS,
River Rouge, Michigan

Hull 273, scow for Candler Dock & Dredge Co., Detroit; 60 x 28 ft.; **launched 9/18/29; delivered 9/19/29.**

Not named, hull 274, steamship for Pittsburgh Steamship Co.; 580 L.B.P. 60 beam; 19 loaded draft; 12 mi. speed; 12,000 D.W.T.; T. E. engines, 2250 I.H.P.; 3 Scotch boilers 14' I.D. x 12' long; **keel**

9/15/29; launch 1/10/30 est.; deliver 4/15/30 est.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1677, track barge for Yourtel-Roberts Sand Co., Chester, Ill.; 195x30x6'6"; keel July 15/29; launched and delivered 9/25/29.

Hull 1661, steel hull, steam towboat, for stock; 148x30x5 ft.; keel Aug. 20/29.

Hull 1673, combination cargo and oil barge for Amer. Barge Line Co., Louisville, Ky.; 150x35x11 ft.; keel 5/10/29; launched 9/10/29.

Hull 1674, sister to above; keel 6/5/29; launched 9/28/29.

Hull 1675, sister to above; keel 9/13/29.

Hull 1676, sister to above; keel 10/3/29.

Hull 1678, steam towboat for Vesta Coal Co., Pittsburgh; 139'6" L.B.P.; 34' beam; 7'4½" depth molded; comp. condensing eng.; 1 42" dia. water-tube boiler; Foster-Wheeler Nelis steam generator.

Hull 1679, sister to above.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

City of Saginaw, hull 246, car ferry for Pere Marquette Rail; Co.; 368 L.B.P. 57 beam; 17 loaded draft; 18 m. speed; 2 turbines: 3600 I.H.P. each; 4 Babcock & Wilcox W.T. boilers; keel Mar. 4/29; launch Aug. 6/29 est.

City of Flint, hull 247, car ferry, sister to above; keel May 1/29.

Reality, hull 248, steel yacht, owner not named; 78 long; 15 beam; 8'9" depth; 6' draft; 150 H.P. Fairbanks - Morse eng.; keel June 12/29; launch Aug. 3/29 est.

Hull 251, derrick barge for T. L. Durocher, Detour, Mich.

Hull 252, same as above.

MIDLAND BARGE COMPANY
Midland, Pa.

Five steel cargo barges for Inland Waterways Corp.; 230x45x11 ft.; 3 delivered.

One steel hull for New York State Canal Comm.; 106x30x7 ft.

Five steel barges for N.Y. State Canal Comm.; 75 x 25 x 5'6"; 4 keels laid; 2 launched and delivered.

One hopper barge for Parsons & Rader Transp. Co. 100 x 24 x 6'6".

One mooring barge for Couger-Korsmo Const. Co.; 200x15x4 ft.

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Stadacona, hull 24, bulk freighter for Canada Steamship Lines, Ltd., Montreal; 582 L.B.P.; 60 beam; 20 loaded draft; 11 knots speed; 12,000 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 Scotch boilers; 15'3" dia x 11'6" lg.; keel Apr 17/29; launched 9/26/29; deliver 10/28/29 est.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, R. L. Baldwin.

Hull 200, towboat, owner not named; 56x14x5'6"; keel July 15/29.

Hulls 201-4 inc., four deck barges for stock, 130x32x8 ft.; keels laid 6/24, 7/1, 7/6, 7/12; launched 7/24, 7/25, 8/6, 8/7.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy. 10,000 tons displacement; keel May 1/28; launched Sept. 7/29; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Pennsylvania, hull 329, 18 - knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers: keel Oct. 15/28; launched July 10/29; deliver Oct./29 est.

Not named, hull 337, passenger liner for A.G.W.I. Nav. Co., New York; 508 x 70'9" x 39'; 15,380 tons displ.; 16,000 S.H.P.; 20 knots speed; turbo-elec. drive; keel July 23/29.

Not named, hull 338, sister to above; keel July 8/29.

NEW YORK SHIPBUILDING CO.
Camden, N. J.

Purchasing Agent: J. W. Meeker.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; launched Jan. 23/29; deliver July 9/29 est.

Chester, light cruiser CL- 27 for United States Navy. 10,000 tons displacement; keel Mar. 7/28; launched 7/3/29; deliver June 13/30 est.

Santa Clara, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'9" beam; 37'5" depth; General Electric turbo-electric machinery; keel Feb. 4/29; launch Nov./29 est - deliver Apr /30 est

Hull 392, carfloat for Erie R.R.; 366 x 38 x10'5": keel June 26/29; launched 9/26/29; delivered 10/6/29.

Hull 393, same as above; keel June 26/29; launch 10/10/29 est.; deliver 10/21/29 est.

Not named, hull 394, passenger and cargo steamers for Export Steamship Corp., New York; 450x61'6"x42'3"; keel 12/1/29 est.

Not named; hull 395, sister to above; keel 12/1/29 est.

Not named, hull 396, sister to above;

keel 10/1/30 est.

Not named, hull 397, sister to above; keel 11/1/30 est.

Hull 398, cement barge for International Cement Corp.; 156'x37'4"x13'; keel July 22/29; launched 9/30/29; delivered 10/3/29.

Not named, hull 399, light cruiser No. 35 for United States Navy; 10,000 tons displacement.

Hull 400, barge for Hercules Cement Corp.; 200x37x9'6"; keel 11/29 est.; launch and deliver 2/1/30 est.

THE PUSEY & JONES CORP., Wilmington, Del.

Purchasing Agent: James Bradford.

Nakhoda, hull 1040, yacht for Fred J. Fisher, Detroit; 236 L.O.A.; 34 beam; 19 depth; 12'6" draft; 2 1100 H.P diesel engs.; keel Feb. 12/29; launched 8/20/29; deliver 11/15/29 est.

Rene, hull 1041, yacht for Alfred P. Sloan, Jr., New York; same as above; keel Feb. 12/29; launched 9/19/29; deliver 12/1/29 est.

Cambriona, hull 1042, yacht for owner not named; same as above; keel Mar. 12/29; launched 10/7/29; deliver 12/29 est.

Lotusland, hull 1043, twin screw diesel yacht, ordered by Cox & Stevens, Inc., New York; 168'9" long, 28' beam; two 500-B.H.P. diesel eng.; keel June 13/29; deliver Dec /29 est.

Not named, hull 1044, oil tanker for Tide Water Oil Co.; 255 L.B.P.; 44 beam; 15'6" loaded draft; 1250 I.H.P. diesel-electric propulsion.

THE SPEAR ENGINEERS, INC., Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor. keel Aug. 18/28.

City of Norfolk, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P., keel Feb. 1/29; launch July 30/29 est.

SPEDDEN SHIPBUILDING CO. Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Argos, hull 265, steel hull, steam driven, patrol vessel for Supervisors of New York Harbor, 39 Whitehall Street, New York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam; 10'1½" mean draft; T. E. engs.; Babcock & Wilcox W.T. boilers; keel Apr. 6/29; launched 9/5/29; deliver 12/12/29 est.

Not named, hull 266, steel hull freight and passenger tug for U. S. Dept. of Public Health, Boston; 91 L.O.A.; 20 molded beam; 9 draft; 350 H.P. Standard diesel eng.; keel 10/15/29 est.

Not named, hull 267, steel hull diesel tugboat for Oil Transfer Co., 17 Battery Place, New York; 95 L.O.A.; 22 beam; 10'6" loaded draft; eng. not decided; keel 10/20/29 est.

Not named, hull 268, steel hull diesel tugboat for Atlantic, Gulf & Pacific Co., New York; 57 L.O.A.; 14'4" beam; 5'6" loaded draft; 120 H.P. Fairbanks-Morse diesel eng.; keel 10/20/29 est.

SUN SHIPBUILDING COMPANY, Chester, Penn.

Purchasing Agent: H. W. Scott.

City of New York, hull 116, passenger and freight motorship for American South African Line, Inc., New York; 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs.; keel Mar. 14/29; launched 10/19/29; deliver Nov. 15/29 est.

Not named, hull 120, single-screw, diesel tanker for Motor Tankship Corp.; 13,400 D.W.T.; keel 6/5/29; launch 10/15/29 est.; deliver 11/30/29 est.

No name, hull 122, sister to above; keel 9/12/29.

Not named, hull 123, sister to above.

Not named, hull 124, sister to above.

Not named, hull 125, single screw, steel, diesel-electric tanker for Tide Water-Associated Transport. Corp., New York; 13,450 D.W.T.

Not named, hull 126, sister to above.

TOLEDO SHIPBUILDING CO., Toledo, Ohio.

Purchasing Agent, Otto Hall.

Not named, hull 182, fire boat for City of Detroit; 125 L.B.P.; 29 beam; 10 loaded draft; 14 mi. speed; comp. engs.; 950 I.H.P.; 2 B. & W. boilers; deliver Aug./29 est.

Not named, hull 183, steel ferry for Wabash Rly. Co.

UNITED DRY DOCKS, Inc. Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Socony 23, hull 790, tug for Standard Transp. Co., New York; 91'6"x22'x10'9"; 12 loaded speed; comp. eng. 500 I.H.P. 1 Scotch boiler: 12'6"x11'; keel June 29/29; launched 9/19/29; deliver 10/20/29 est.

Socony 27, hull 791, tug, sister to above; keel June 29/29; launch 10/10/29 est.; deliver 11/5/29 est.

Not named, hull 792, tug for Henry Dubois Sons Co.; 128 L.O.A.; 27 beam; 14 depth; 12 mi. speed; TE engs. 400 I.H.P.; 1 Scotch boiler 16'x11'6".

Not named, hull 793, tug for Baltimore & Ohio R.R. Co. 118'6" L.O.A.; 25 beam; 13'6" depth; 12 miles loaded speed; comp. steam eng.; 400 I.H.P.; 1 Scotch boiler 15 x 12 ft.

Not named, hull 794, sister to above.

THE CHARLES WARD ENGINEERING WORKS Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Unique, hull 81, yacht for Harold M. Ward, Charleston; 50 x 12 x 4 ft.; keel June 4/29; launched 8/6/29; delivered 8/20/29.

Repairs

BETHLEHEM SHIPBUILDING CORP., Ltd. Union Plant

Drydock, paint, misc. repairs: ferry Klamath, Maui, Virginia, Lubrico, m.s. California, Bolivar, H. M. Storey, Tahiti, J. A. Moffett, Montezuma, ferryboats Golden Way, Golden Bear, Yerba Buena, City of San Rafael, Chas. Van Damme, Sonoma Valley, garbage boats Hoquiam and Taboe, derrick barge Edward, U.S. cutter Inspector. Generator repairs: Frank Lynch. Make and furnish one eng. cylinder: Dilworth, Nevada, Ventura. Pipe repairs: Oilshipper, whaler Port Saunders, Corato, Pleiodon. Steering engine repairs: Romanstar, President Harrison. Propeller repairs: Texmar, U.S.S. Procyon, West Cape, Barbara Cates, Point Bonita. Patch tank top: President Johnson. Tailshaft repairs and renewals: Florence Olson, La Brea, tug Sea King (also furnish bronze propeller), Capt. A. F. Lucas, Matson Nav. Co. Turbine repairs: President Lincoln, President Grant. Install 40 boiler plates, misc. repairs: San Jose. Remove doors and test main condenser: Point Bonita. Misc. repairs: City of Los Angeles, Ontariolite, Golden Tide, Santa Barbara, Java Arrow, Sylvan Arrow, Hawk, President Harrison, H. T. Harper, Silverfir, Sea Rover, C. O. Stillman, Admiral Chase, H. M. Storey, Santa Maria, Bandon, John C. Kirkpatrick, Albert Hill, La Perla, Point Sur, Esther Johnson, Mongolia, Limon, Point Bonita, Dispatch No. 1, San Mateo.

CHARLESTON DRYDOCK AND MACHINERY CO., Charleston, S.C.

Docked for rudder repairs: dredge Dan C. Kingman. General overhauling: str. Cibao. General repairs: str. Sprigg Carroll, Charleston District lightships.

COLLINGWOOD SHIPYARDS, Ltd. Collingwood, Ont.

Rudder repairs: Valcartier. New shaft: Meseford.

PRINCE RUPERT DRYDOCK AND SHIPYARD, Prince Rupert, B.C.

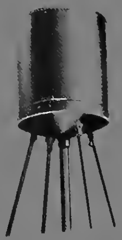
Docked, cleaned, painted and annual overhaul: C.G.s. Newington. Docked for inspection, minor repairs: snagboat Bobolink. Docked, cleaned, painted, misc. repairs: 2 scows, 13 fishing boats. Misc. hull and engine repairs, not requiring docking: 24 fishing boats. 71 commercial jobs.

TODD DRY DOCKS, Inc., Seattle, Washington.

Drydock, misc. repairs: Charles R. McCormick, Indianapolis, Lake Frances. Drydock, clean, paint, misc. repairs: President Cleveland, President Pierce. Misc. repairs: Diana Dollar, Dorothy Alexander, Sagebrush, tug Tyes.

U.S. NAVY YARD, Bremerton, Washington.

Dock and misc. repairs: California, Tennessee. Misc. Repairs: Lexington. Misc. repairs incident to operation as district craft: Mahopac, Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.



Well over 300 vessels now protected by Kolster Radio Compass

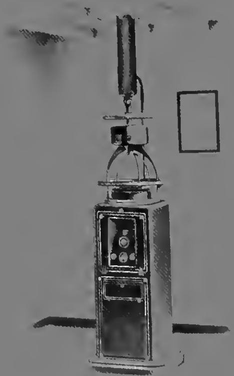
A highly perfected scientific navigational instrument that affords a practical means of taking bearings on distant invisible radio stations or beacons.

The KOLSTER RADIO COMPASS provides a means of taking bearings in fog comparable in accuracy with bearings of visible objects and at much greater distances. In fact, it provides at present the only means available of taking accurate bearings in fog. It may also be used for taking bearings at distances beyond the limits of visibility when desirable.

For locating a vessel in distress at a distance whose position is unknown or whose reported position is erroneous, the radio compass affords the only means available for [illegible] other than blind search.

Fundamentally, the advantages of the KOLSTER RADIO COMPASS are the same as in having on the ship the navigational instruments for sight bearings. It is a [illegible] addition to any ship's radio telegraph equipment.

KOLSTER RADIO COMPASSES are now available in both the large standard model, Type AM 4490-C, and the newly developed junior model, Type AM 5000.



Improved Standard Model Kolster Radio Compass Type AM 4490-C.

Fifteen vital improvements are incorporated in the latest Standard Model Kolster Radio Compass, a few of which are:

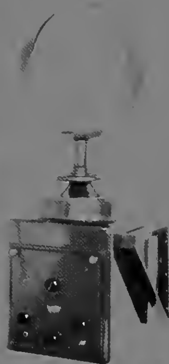
POSITIVE WEATHER PROOF HOUSING FOR LOOP ANTENNA AND ALL MOVABLE PARTS. Manipulation is thus made as completely independent of weather conditions as the reception of radio signals from a distant station.

BINNACLE SPECIALLY DESIGNED TO ACCOMMODATE THE SPERRY REPEATER and when incorporated, geographic bearings of sending stations are taken directly on the repeater.

VISUAL BEARING UNIT: An original and exclusive KOLSTER feature. A small Neon lamp flashes the characteristic signals of the transmitting station. This visual indicator, while intended as an accessory to the headphones, may be used alone to great advantage at short distances. With this feature the KRC can be employed to stand watch unattended for signals from other vessels or beacon stations dead ahead or any direction desired.

The Junior model Kolster Radio Compass, Type AM 5000, pictured at the right, is a small, compact, direct reading instrument which may be readily installed on the smallest vessel at a very moderate cost.

The Kolster Radio Compass, Type AM 5000, is not a cheapened model of the Standard Kolster Radio Compass, nor is it offered as a substitute for the Standard Compass, but it is an instrument specifically designed for small vessels where space is limited and where the question of cost may be an important factor. It is offered with the sole purpose in mind of enabling small craft to avail themselves of this important aid to navigation and to enjoy equal safety at sea with the larger ocean going steamers.



Junior Model Kolster Radio Compass, Type AM-5000

Write or telephone for photographs and detailed descriptive literature

Mackay Radio and Telegraph Company

Sole Agents in the United States

SEATTLE	PORTLAND	OAKLAND
TACOMA	LOS ANGELES	SAN DIEGO
SAN FRANCISCO	HONOLULU	NEW YORK

"Kolster"—The original Radio Compass—still the finest!

Who Did What ...and How

The new fireboat added to the City of Tacoma Fire Protection Service was constructed after a very elaborate survey was made of ships of this class in other cities. Needless to say Tacoma is quite proud of this new addition. It is claimed that the efficiency of this unit is beyond anything ever before built, considering the cost.

This boat is equipped with five

425 H.P. Sterling Viking No. 2 gasoline engines fitted with quadruple ignition.

Shell service is shown here filling the new fireboat with Shell 400 gasoline from the tank wagon.

The Captain of the ship is William Braaton, the Chief Engineer is Le Roy Vaughn.

The new Motorship "Egero" built by Messrs. Swan, Hunter and Wigham Richardson for the owner Mr. O. A. T. Skjelbred of Christiansand, Norway, was recently filled in San Francisco with Shell diesel cylinder oil. Shell received the initial fill-up order and will continue to lubricate the vessel indefinitely. This vessel is fitted with Sulzer engines built by Wallsend Slipway and Engineering Company, Ltd.

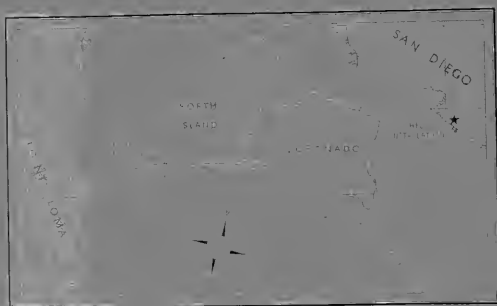
Shell also recently received the initial fill up order for the Motor Vessel "Westralia." She is fitted with two Burmeister & Wain single acting engines developing a total of 6600 I H P.

Shell world wide service is established for the convenience of shipping interests and in every principal port in the world and in many of the smaller ports fuel oil bunkering stations are maintained and lighters and barges are available for shipside service.

It is a combination of two things that make Shell marine fuels and lubricants so popular in shipping circles.

First the products themselves meet the most exacting standards. They've made speed and economy records aplenty to prove that point. Second, Shell marine products are available everywhere. Scarcely a port worthy of the name is without Shell installation.

hell acilities at an iego



Ships calling at San Diego will find Shell ready with rapid deliveries of fuel from ample supplies kept on hand.

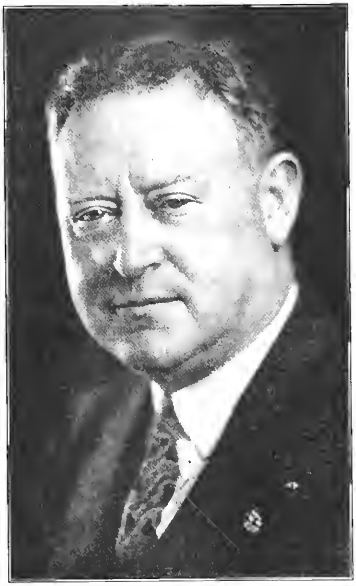
Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

Edward T. Ford, vice-president on the Pacific Coast for **W. R. Grace & Company** and president of the **Panama Mail Steamship Company,** with **Daulton Mann,** general manager of the Panama Mail Steamship Company, is now in the East.

Their presence is in connection with the plans of the company for the construction of new tonnage for the Panama Mail Line's California-Central American New York service. Ford frankly stated that the Panama Mail Line is seeking a mail contract from the government which would permit the company to build new ships with a speed of 18 knots, and increased passenger accommodations.

The outcome of the petition of the Panama Mail Company for the contract will be decided by President Hoover's interdepartmental committee. Ford stated that President Hoover's committee has in hand the solution of the new American merchant marine. More than 100 millions of dollars of American shipbuilding is locked up pending the decisions of this committee.



A. F. Zipf, vice-president and general manager of the Williams Steamship Corporation. Zipf was formerly Pacific Coast manager for the Williams Steamship Company. When the American-Hawaiian Steamship Company purchased the business and fleet of the Williams Steamship Company, it formed the Williams Steamship Corporation to take over this new business, and Zipf was selected as the general manager for the new firm.

Pacific Coast maritime interests are hopeful that the government will grant the mail contract to the Panama Mail Line, operators of the only regular passenger and freight service from New York and California to many ports in Central America by way of the Panama Canal.

Joe Bisbiglia, secretary to the purchasing agent of the Dollar Steamship Company, has returned to his duties after a wedding trip south with his bride the former Katherine Tomasello, daughter of Mr. and Mrs. F. Tomasello of Berkeley.

A refund of $359,436 on income and profits was returned to the **Nippon Yusen Kaisha** by the United States Government, following readjustment of taxes against the company for over-assessments in 1917.

On a tour of the world, with the main objective concerning lumber loading regulations, **Dr. S. J. Montgomerie** of London, chief surveyor of Lloyd's Register of Shipping, and **James French,** New York surveyor for Lloyd's, carried on extended conferences with Puget Sound lumber shippers.

Among the important matters discussed was the possible alteration of rules to permit larger cargoes of lumber, some of the operators requesting that 250,000 to 300,000 feet of lumber be added to the maximum load of the average carrier.

Following the conference, and without any decision being made, Dr. Montgomerie sailed for Japan. He will report his observations and findings to the executive directors of Lloyd's upon his return to Europe from the Far East.

Henry F. (Heine) Gelhaus, marine superintendent for the Nelson Steamship Company of San Francisco, after being on "drydock" for repairs and general overhauling, is again on the job. He has been completely reconditioned and is again fine and fit as a fiddle, he reported.

After twenty-seven years with the marine department of the Standard Oil Company (Calif.), **W. S. (Bob) Bennison** has retired. He is

Arthur M. Tode, superintendent of the Technical Division, Marine Department of The Texas Company, was re-elected chairman of the Marine Section of the National Safety Council at the recent Eighteenth Annual Safety Congress held at Chicago. This Congress is said to have been the largest convention of its kind ever held in the world; over 7000 commercial executives attended as accredited delegates.

now away in the hinterlands on a vacation. "Bob" retired with the rank of inspecting engineer and the well-wishes of the entire marine department.

David B. LeVake is now chief engineer on the freighter Golden Tide of the American-Hawaiian fleet. He was formerly chief engineer on the Golden Peak.

J. R. Macauley is the first assistant engineer.

During the absence of **William J. Hatton** in the East, **William (Bill) DeBraal,** is chief engineer of the freighter Doylestown of the Nelson Steamship Company.

Edward B. Bown, for some time first assistant engineer on the **Lassco** freighter Diamond Head, has been promoted to the position of chief engineer aboard the freighter Helen Whittier, operating intercoastal by the Arrow Line.

Captain and Mrs. **Allen A. Sawyer** on September 3 celebrated their fifteenth wedding anniversary. Captain Sawyer is master of the Los Angeles Steamship Company's liner Calawaii, plying between Los Angeles harbor and Honolulu. He is one of the most popular navigators in this trade and has been receiving many congratulations from his friends.

The next dinner-meeting and entertainment of the **Propeller Club of San Francisco** will take place early next month. **Captain Stanley E. Allen,** secretary, announces that the membership roll now approaches 500. The Club, organized less than five months ago, is the largest similar organization in the United States.

Joseph P. Dolan, inspector of United States Hulls and Boilers, and **James E. Cronin,** marine superintendent of the Standard Oil Company (Calif.), president and chairman of the board of directors, respectively, announced the following well known maritime executives to have charge of the details in connection with the December dinner-meeting and entertainment:

Dinner: **Kenneth Ingraham, Fletcher Munson, John Dodds, John O'Hare.** Reservations: **Fred Cordes, Thomas Foster, Joseph Hollings.** Decorations: **Jerome Lalor, J. M. McConkey, H. M. Bolton.** Entertainment: **Karl Eber, Herbert J. Anderson,** and **Orville Davis.**

E. J. Schwanhausser, recently appointed manager of the Buffalo Works of the Worthington Pump and Machinery Corporation.

Secretary Allen reported that a special committee was now engaged in contracting for a designated downtown hotel where the Propeller Club of San Francisco will hold weekly luncheons.

Another important matter of business before the board of directors, under the direction of Chairman Cronin, is the selection of an available site for the erection of a clubhouse. The structure's cost has not been determined upon, but the committee has been instructed to seek a suitable site and submit plans for the erection of beautiful quarters for the organization.

"Artie" Cronin, son of James Cronin, superintending engineer of the Marine Department, Standard Oil Company (Calif.). Artie accompanies his dad on fishing excursions, and frequently, as on the occasion pictured here, shows the "old man" up.

Captain C. W. Saunders of the Matson Steamship Company, has been named chairman of the San Francisco Chamber of Commerce Maritime and Harbor Committee by President Almer M. Newhall. Captain Saunders succeeds H. C. Cantelow who was recently appointed general manager of the Alaska Steamship Company with headquarters in Seattle.

Other members of the committee are: **J. R. Fitzgerald,** vice chairman; **Captain A. E. Anderson, C. W. Cook, Jr., R. Stanley Dollar, Walter E. Hettman, Kirkwood Donavin, Eugene C. Loyd** and **C. C. Mallory.**

With a membership of more than one hundred to date, the **Propeller Club of Seattle** is well under way and promises to be the outstanding maritime organization of the Pacific northwest. **W. T. Isted,** secretary-treasurer, in a communication to the writer, reported that the following well known shipping leaders had been elected trustees:

George R. Cary and **Captain J. R. Jones,** elected for three years, **Captain Donald S. Ames** and **A. R. Hunt** for two years, and **A. F. Haines** and **Captain C. J. Stewart** for one year.

These six men, together with **Otto H. Eisenbeis,** president, **C. H. Carlander,** vice-president, and **W. T. Isted,** secretary-treasurer, constitute the board of governors.

C. H. Carlander, chairman of the membership committee, announces that the membership fee is now \$10, and yearly dues \$10.

'Twill be a merry gathering—the sixth annual steamship dinner to be held by the San Francisco maritime fraternity in the Palace Hotel, Saturday night, November 9.

General Chairman **Thomas J. Crowley,** announces the following well known shipping tycoons as chairmen and aides for the dinner:

M. J. Buckley, Dollar Line, chairman of the reception committee, assisted by the following: **A. P. Zipf,** Williams Line; **Zac T. George,** Luckenbach Line; **Dearborn Clark,** American-Hawaiian Steamship Company; **Takeo Yamamoto,** Nippon Yusen Kaisha; **R. J. Ringwood,** Pacific Steamship Company; **Captain Kirkwood Donovan,** Panama-Pacific Line. **George J. Yater** is chairman of the dinner committee, assisted by **L. P. Bailey** and **J. L. King, Jr.**

ISTHMIAN STEAMSHIP LINE

FAST REGULAR FREIGHT SERVICE
(via Panama Canal)
Weekly from Baltimore and New York.
Bi-weekly from Norfolk and Portland, Me., to
Los Angeles, San Francisco, Oakland, Seattle, Tacoma,
and Vancouver, B.C.
(Other Ports as Inducements Offer)

ATLANTIC COAST TO HAWAIIAN ISLANDS

Regular semi-monthly sailings from New York—monthly sailings direct from U. S. Gulf, Baltimore, Philadelphia, and Boston to Hawaiian Islands without transhipment.

ARGONAUT STEAMSHIP LINE

INCORPORATED

BALTIMORE and NEW YORK
— to —
SAN DIEGO, LOS ANGELES (Wilmington),
SAN FRANCISCO, PORTLAND.
(via Panama Canal.)

NORTON, LILLY & COMPANY

GENERAL AGENTS FOR THE PACIFIC COAST

(Pier 35)
230 CALIFORNIA ST.

Phone SUtter 3600
SAN FRANCISCO, CALIF.

LOS ANGELES—711 Van Nuys Bldg.
SAN DIEGO—Municipal Pier No. 1
HONOLULU—312 Hawaiian Electric Building.
VANCOUVER Agents—B. W. Greer & Son, Ltd.,
Bank of Nova Scotia Building.

SEATTLE—L. C. Smith Bldg.　PORTLAND—Yeon Bldg.

JOHNSON LINE

Direct Freight and Passenger Service
To and From

PACIFIC COAST PORTS — SCANDINAVIAN PORTS

Hamburg and Other European Ports as Inducements Offer

Through Bills of Lading Issued to All Scandinavian, Finnish & Baltic Ports.

MONTHLY SAILINGS

Vessels Call at Antwerp Outward From Europe

GRACE LINE

EXPRESS FREIGHT AND PASSENGER SERVICE TO AND FROM

WEST COAST SOUTH AMERICA

Los Angeles—San Francisco—Puget Sound—British Columbia—Monthly Sailings.

FOR RATES, FREIGHT SPACE AND OTHER INFORMATION APPLY

W. R. GRACE & CO.

General Agents Pacific Coast

332 PINE STREET :: SAN FRANCISCO

LOS ANGELES
M. F. & H. R. McLAURIN
618 Central Bldg

PORTLAND
LIDELL & CLARKE

SEATTLE
W. R. GRACE & CO., Agts.
Hoge Bldg.

VANCOUVER, B. C.
C. GARDNER JOHNSON, Agt.

Another big, fast
Panama Pacific Liner

S. S. PENNSYLVANIA

enters Coast-to-Coast Service

On November 9 the third new electrically driven liner of the Panama Pacific Line sails from San Francisco to New York. This great 32,450 ton steamer rounds out an unprecedented building program which in about three years has added to the American Merchant Marine the three largest and fastest steamers ever built under the American flag.

Regular fortnightly sailings 13 days Coast-to-Coast. Most modern cargo facilities. Luxurious passenger accommodations.

Panama Pacific Line

INTERNATIONAL MERCANTILE MARINE COMPANY
460 Market Street, San Francisco, California

RED STACK TUGS

Harbor and Coast Towing

SALVAGE TUG "SEA SALVOR"

THE SHIPOWNERS & MERCHANTS
TUGBOAT COMPANY

GREEN STREET WHARF (PIER 15)
Telephones: Davenport 3497-3498; Davenport 4268
OFFICE OPEN DAY AND NIGHT

Extensive reconditioning of the two Hamburg-American transatlantic liners Resolute and Reliance has been decided upon by the board of directors. Emil Lederer, member of the executive board made the announcement. He said that the second and third class accommodations will be eliminated. When placed in service between New York, Channel ports, and Hamburg, the Reliance and Resolute, with the exception of the Minnetonka and the Minnewaska, will be the only Atlantic liners carrying first class passengers exclusively.

Lederer stated that the Hamburg-American Line was adopting a policy of watchful waiting on the programs contemplated or now underway by other large transatlantic steamship companies regarding plans for attaining first rank in operating new ocean speed liners He said that the Hamburg-American's tonnage is now almost at prewar level, amounting to more than 1,150,000 tons, with services to all parts of the world.

Lederer's announcement was made upon his recent return from a conference with the board of directors in Germany.

A new freight forwarding company has been organized in New York by **Robert A. Krug,** formerly vice-president of the Kerr Steamship Company, and **Robert J. Trodden,** former official of the Barber Steamship Line. Both are well known on the Pacific Coast.

W. H. Baker, president of the Merritt Chapman & Scott Corporation, was recently elected a member of the directorate of the United Dry Docks, Inc., New York.

E. C. C. Wellesley, San Francisco district freight agent for the Nelson Steamship Company, widely known in Pacific Coast maritime circles, has severed his connections with that organization.

The naming of **Captain William A. Hall** as Columbia River Pilot marks the erasing of the name of Hall from the records of the Admiral Line for the first time in half a century.

Captain Hall has been with the Admiral Line for thirty years. His father, the late **Captain Charles Hall,** was in command of the coastwise liner Admiral Dewey. He left behind a record of never being in an accident.

Colonel Thomas B. Esty, who attended the dedication of the Ohio River Canalization Project as delegate from the City of San Francisco and the Chamber of Commerce of San Francisco. Colonel Esty is the Pacific Coast representative of the Inland Waterways Corporation.

Many ideas in wharf and dock construction were gleaned from the recent visit of **Fred J. Easterbrook,** chief engineer for the Hongkong Wharf & Godown Company of Hongkong, he reported after making an inspection tour of San Francisco's waterfront. Easterbrook's trip is in connection with inspecting all the large harbors of the United States and Europe, preparatory to his company engaging in a $3,000,000 wharf and dock building program in Hongkong. His company operates all of Hongkong's public wharves. The company will build two new docks, one of them 800 feet in length.

Joseph Panther, Jr., inspector for the Fire Department of the City of Tacoma, who has invented a special monitor nozz'e for fighting fires under piers. The initial installation of this nozzle was made on the new Tacoma Fireboat No. 1.

After being connected with the Hamburg-American Line for thirty-six years, **Herman Mathenius** has retired.

He was stationed in New York as assistant freight traffic manager. He joined the company as an office boy at the age of 14, in July, 1893. During the war, Mathenius was foreign freight agent for the Mallory Line and then went with the New York Argentine Company as traffic manager. In 1920, he re-joined the Hamburg-American Line.

He is widely known on the Pacific Coast, having been a visitor many times.

Home from the sea for good and to make his residence in San Francisco as a retired mariner, Captain **Basil Meredith Aldwell,** is now shore-side after spending practically a life-time with the Union Steamship Company. His last command was the liner Tahiti, now skippered by Captain **A. H. Davey.**

Captain Aldwell started as a cadet with the Union Line. He commanded sailing ships as well as steamers for the company and is known to thousands of travelers in all parts of the world.

Healy-Tibbitts Construction Company of San Francisco is starting plans for the construction of Pier No. 1, the first work in the $10,000,000 waterfront program for San Francisco as outlined sometime ago by the Board of State Harbor Commissioners.

While the contract awarded calls for only the expenditure of $246,300, the completed pier will represent a cost of $700,000. It will be 700 feet long, 150 feet wide, with 35 feet of water at low tide for the docking of passenger and cargo vessels.

On October 22, **Robert Thackara** was unanimously re-elected chairman of the Intercoast Lumber Conference. The election was carried out to confirm his duties, as he has been acting as temporary chairman of the body in addition to his chairmanship of the United States Intercoastal Conference.

Although the liner Humboldt is

NORTH PACIFIC COAST LINE

JOINT SERVICE OF

Holland-America Line , , Royal Mail Steam Packet Company

Between
PACIFIC COAST PORTS
AND UNITED
KINGDOM AND
CONTINENTAL
PORTS

ALL VESSELS
ARE ESPECIALLY
FITTED WITH
REFRIGERATOR
SPACE FOR
CARRYING
PERISHABLES

The Pioneer Refrigerator Service

120 Market Street HOLLAND-AMERICA LINE San Francisco

Fastest Passenger and Freight Service

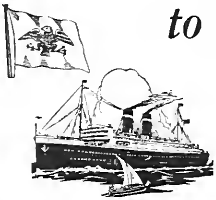
to New York

WITH DIRECT CONNECTIONS FOR EUROPE

Sailing Every other Saturday from San Francisco
Every other Monday from Los Angeles

PASSENGER OFFICES:
460 Market St. ....San Francisco
715 West Seventh St..........Los Angeles
1333 Fourth Ave..........................Seattle

FREIGHT OFFICES:
Pacific Steamship Company.
311 California St. ......San Francisco
Pacific S.S. Co.'s Terminal.......Seattle
204 Central Bldg. ....Los Angeles



Panama Pacific Line

INTERNATIONAL MERCANTILE MARINE CO.

ISTHMIAN STEAMSHIP LINES

PACIFIC-UNITED KINGDOM SERVICE

FROM PACIFIC COAST PORTS TO LONDON, LIVERPOOL,
AVONMOUTH, also GLASGOW, BELFAST, DUBLIN

For Rates and Particulars Apply to

E. C. EVANS & SONS, Inc.

General Agents Pacific Coast

260 California Street, San Francisco Phone—Douglas 8040-8041-8042

B. W. GREER & SON, LTD., Agents, Vancouver

NORTON, LILLY & COMPANY, Agents, Portland, Seattle, Los Angeles and San Diego

---

FURNESS LINE

"THE UP-TO-DATE REFRIGERATOR SERVICE."

Express, Freight and Passenger Service

Pacific Coast Ports *to* United Kingdom

FURNESS [Pacific], Ltd.

Pacific Coast Agents

VANCOUVER SEATTLE PORTLAND
SAN FRANCISCO LOS ANGELES

in and out of port in her coastwise schedule carrying passengers and freight between San Francisco and southern California ports, **Charles L. Christian**, purser, and known to thousands of voyagers, had time to slip away from his duties in San Francisco and claim **Miss Eunice Gwendolyn Homm** as his bride.

The couple first met when Miss Homm was a passenger on the Humboldt. News of the wedding was followed by hundreds of messages of congratulation to the newlyweds from all parts of the Pacific Coast.

Erik Krag, manager of the European services for the General Steamship Corporation, is now chairman of the Pacific Coast-European Conference. His term will be for six months. He succeeded **John Van Meurs.**

H. M. Runyon, Pacific Coast representative of the Intercoastal Conference, has appointed **Thomas G. Widmeyre** as manager of the weighing and inspection bureau in charge of all ports. Widmeyre's headquarters will be in San Francisco.

Widmeyre has been with the bureau for several months. He was formerly with the California & Eastern Steamship Company.

H. C. Cantelow, widely known in American steamship circles, is now in charge of all the affairs of the Alaska Steamship Company with the title of general manager and is located in Seattle.

Cantelow, following his resignation as vice-president of the Luckenbach Steamship Company, organized his own company and was identified with steamship activities under the H. C. Cantelow & Company name, until he was asked by **E. T. Stannard**, vice-president, to become general manager of the Alaska Steamship Company.

Cantelow has always identified himself with activities bearing towards the better development of Pacific Coast commerce.

A. J. Houda, for fifteen years with the Nelson Steamship Company, resigned his position as traffic manager. Houda's resignation came as a distinct surprise as no intimation had been divulged prior to the announcement of Houda that he had severed connections with the Nelson interests.

Houda is now on vacation. He stated he had no immediate plans, "but would look around after taking a rest."

Captain Lebius Curtis, Jr., member of the firm of Pillsbury & Curtis, naval architects and marine surveyors of San Francisco. Captain Curtis recently renewed his experience as a shipmaster by navigating the Japanese freighter Heber across the Pacific for delivery in Japan.

Robert "Bob" Donaldson, well known in San Francisco Bay shipbuilding activities, is now with The Moore Dry Dock Company as assistant to William Harrower, superintendent of the company. Donaldson is not new to the Moore company as he served for several years with Moore's.

Dr. Bernard Hague, principal lecturer in Electrical Engineering at the University of Glasgow, Scotland, has accepted the invitation of the Polytechnic Institute of Brooklyn to serve as Visiting Professor of Electrical Engineering at Polytechnic for the present academic year.

Captain F. W. Roberts, who was recently appointed supervising port captain of the Southern Pacific-Golden Gate Ferries, Ltd., San Francisco, after 33 years experience in transbay ferry service.

Dr. Hague, who has degrees from the Universities of London and Glasgow, is the holder of the Siemens Medal for Electrical Engineering and the Henrici medal for Mathematics as well as the Diploma of the Imperial College of Science for Postgraduate Research. He is a member of the Institute of Electrical Engineers, the author of several standard works on electrical theory and measurements, and is a recognized authority in this field.

He will have charge at Brooklyn Polytechnic of the conduct of graduate study and research in electrical engineering in the new plan now being developed at that institution for the benefit of technical graduates in the metropolitan district who desire to earn advanced engineering degrees by evening study.

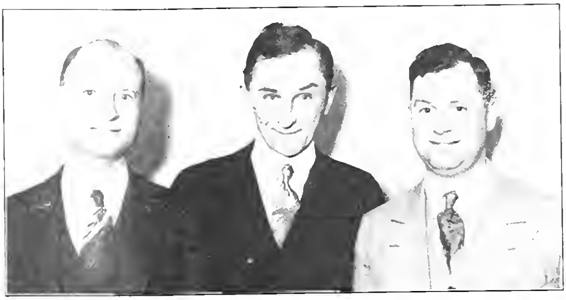
A double anniversary celebration was held aboard the French Line steamer Alaska at San Francisco, October 17, the guests of honor being **Abe Marks**, manager of the marine department of the San Francisco Chamber of Commerce, and **Eric Krag**, manager of the European and Cuban services of the General Steamship Corporation.

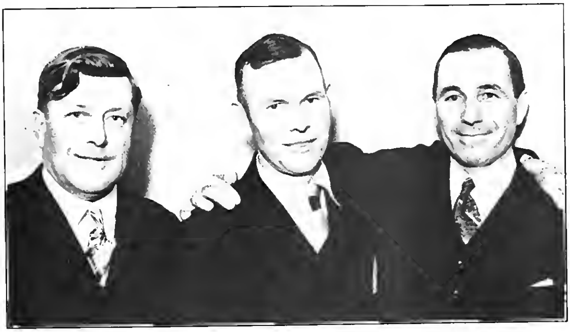
Marks, who recently rounded out forty years with the old Merchants Exchange, which was in 1913 succeeded by the marine department of the Chamber of Commerce, and Krag, who recently celebrated his fifteenth anniversary in the steamship business in San Francisco, staged the party jointly, Krag playing the part of host.

Marks, in his younger days was an expert boatman, and a pupil of the late Mike Fitzgerald, who taught him all the tricks of the art. He also spent much of his time, when he could get away from his duties, cruising on the old pilot boats Lady Mine, Caleb Curtis, and America.

The guests at this function included Lieutenant **Albert J. Porter**, editor of the Shipping Register, who also acted as master of ceremonies; **Arthur Beyer**, assistant manager of the marine department of the Chamber of Commerce; **Eddie Macfarlane** of the Standard Oil Company, **Gerald Hampton** of the Dollar Steamship Company, **Paul Faulkner** of the Pacific Marine Review and **Harry Pinkham**, ex-president of the Board of Marine Underwriters, and now president of the N. B. Club.

Some Snaps at the Propeller Club Dinner





Left to right: Upper row: Mike Rhine of the General Electric Company, San Francisco; Ben Hedstrom, naval architect, of San Francisco; and Captain Barney Leviton, of the Southern Pacific Company. Middle row: Captain Chas. Heath, superintendent of Southern Pacific Company's transbay passenger services; Jim Cronin, superintending engineer of the Marine Department, Standard Oil Company (Calif.); Captain William Darragh, Red Stack Tugboat Company; Charlie Pratt; and Captain Gerald January. Lower row: Joseph Gisler, of W. H. Worden & Co., San Francisco; Hugh Paladini; Major Kingsford Smith, famous Ace; and Captain Stanley E. Allen of the Marine Department, Standard Oil Company (Calif.), secretary of the Propeller Club.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912

Of PACIFIC MARINE REVIEW, published monthly, at San Francisco, Calif., for October 1, 1929

State of California, County of San Francisco

Before me, a Notary Public in and for the State and County aforesaid, personally appeared Bernard N. DeRochie, who having been duly sworn according to law, deposes and says that he is the Business Manager of the Pacific Marine Review, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher: Jas. S. Hines, 576 Sacramento St., San Francisco, Calif.

Editor: A. J. Dickie, 1036 Mariposa Avenue, Berkeley, Calif.

Managing Editor: None.

Business Manager: Bernard N. DeRochie, 737 Contra Costa Avenue, Berkeley, Calif.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

James S. Hines, owner.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona-fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

(Circulation information is required from daily publications only.)

BERNARD N. DEROCHIE.

Sworn to and subscribed before me this 24th day of September, 1929.

(Seal) EDITH GOEWAY

Notary Public, in and for the City and County of San Francisco, State of California.

(My commission expires November 22, 1932.)

Trade, Traffic, and Shipping

(Section continued from Page 457)

New York to Honolulu in Eight Days

(Continued from Page 457)

the schedule having been arranged to give them a rest of sixteen hours in San Francisco before sailing at noon Saturday, January 25, on the Malolo.

As the Malolo makes Hawaii in just four days from the Golden Gate, passengers on the special train will be swimming at Waikiki the following Wednesday, January 29. From New York to Honolulu, from icy winds to Maytime warmth, in barely eight days, with special de luxe accommodations all the way!

The second train will be operated on the same route and schedule, leaving New York February 18 to connect with the February 22 sailing of the Malolo, landing passengers amid the gorgeous hisbiscus and bougainvillea of Hawaii on February 26.

Freights, Charters, and Sales

October 17, 1929.

THE following steamers have been reported fixed with grain to United Kingdom: British strs. Bencleuch, Nov., and Benreoch, Oct., North Pacific to U.K./Continent, Canadian American Shipping Co.; British m.s. King William, Portland to U.K. Continent, Oct., Balfour Guthrie and Co.; Japanese str. France Maru, Vancouver, B.C., to U.K./Continent, Oct.; a King str., British Columbia to Antwerp or Rotterdam, 24/-, Dec., Earle & Stoddart; British m.s. Elmworth, British Columbia to U.K./Continent, 25/-, Nov., James Stewart Grain Corp.; Japanese str. (Mitsui), British Columbia to U.K./Continent, 25/-, Nov., James Stewart Grain Corp.; British m.s. King Egbert, British Columbia to U.K. Continent, 25/-, Nov., Canadian Cooperative Wheat Co.; Japanese str. Ohio Maru, British Columbia to U.K. Continent, Oct.-Nov.

The following steamers have been reported fixed with lumber to Australia: Japanese str. Seisho Maru, Columbia River to Sydney or Melbourne, $11.50, Pacific Export Lumber Co.; Japanese str. Misaki Maru, North Pacific to Australia, $12.50, Oct., J. J. Moore and Co.; Japanese str. Hokkoh Maru, North Pacific to Australia, $12; Nov.; Japanese str. Miko Maru, North Pacific to Australia, $12.50, Nov.-Dec., American Trading Co.; Japanese str. Ishin Maru, Columbia River, option Humboldt Bay to Australia, $11, Nov., Pacific Export Lumber Co.; Japanese str. Toyohiko Maru No. 2, North Pacific to Australia, Dec., J. J. Moore & Co.

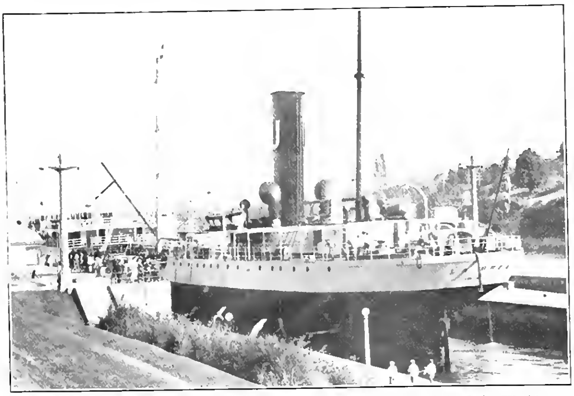
The following steamers have been reported fixed with lumber to the West Coast: American str. Missoula, Eureka and Puget Sound to Balboa, Sept., Hammond Lumber Co.; American str. Tillamook, Eureka and Puget Sound to Guaymas, Nov., Hammond Lumber Co.; Japanese str. Erie Maru, Columbia River to Callao, J. J. Moore & Co.; Danish str. Orion, Puget Sound to Mexico, Anglo Mexican Petroleum Co.; American str. Glendoyle, Eureka to La Union and San Jose de Guatemala, redwood, prompt, Hammond Lumber Co.

The following steamers have been reported fixed with lumber to the Atlantic: American str. Lake Gorin, Columbia River to New York, $9, Oct., Blanchard Lumber Co.; American str. Onondaga, Columbia River to North of Hatteras, $9.25, Krauss Brothers Lumber Co.

The following time charters are reported: British str. Oakworth, Pacific trade, delivery and redelivery U.K. Continent, $1.45, Oct., H. R. MacMillan Export Co.; British str. Gogovale, delivery North Pacific, redelivery, U.K. Continent, Oct., W. L. Comyn & Co.; British str. Golden Sea, North Pacific to U.K. Continent, Nov., W. L. Comyn & Co.; Norwegian strs. Regulus and Evanger, Puget Sound to U.K. Continent, delivery Puget Sound, redelivery U.K./Continent, Oct., W. L. Comyn & Co.; Danish m.s. Indien, delivery Vancouver, redelivery Australia, Nov.

The following sales have been reported: American sh. Dunsyre (to be scrapped), J. M. Botts to Japanese parties; American tk. str. S. C. T. Dodd, $425,000, G. W. Bell, trustee, to Standard Oil Co.,

PAGE BROTHERS, Brokers.



The Union Oil tanker La Brea passing through the Ballard Locks of the Lake Washington Ship Canal, Seattle.

Union Oil Gives Super-Service

AS part of its policy to provide reasonably priced fuel oil to its customers, the Union Oil Company recently inaugurated direct tanker service to the new seven million dollar Shuffleton steam generating plant of the Puget

Sound Light and Power Company near Renton, Washington.

In order to accomplish this, the 11,000-ton seagoing Union Oil tanker La Brea was taken through the channel from Lake Union to Lake Washington. The La Brea is the largest vessel ever to pass through this channel. With 30,000 barrels of oil aboard, the tanker draws approximately 24 feet of water. The channel depth in its shallower portions is not more than 25 feet 9 inches. The beam of the tanker is practically the width of the Ballard locks; so that her sides were almost scraping the concrete.

Passage through the channel from Salmon Bay to the Shuffleton plant is seven miles long. This trip required five hours with tugs guiding the tanker and standing by while she was discharging.

The channel near the power plant had to be redredged before the La Brea could come through. Special dolphins were driven alongside the dock to breast off the tanker while unloading.

Captain H. L. Dahllof is master of the tanker La Brea and had charge of her during this trip.

Machinery on the Pennsylvania

(Continued from Page 452)

lators, one 5-horsepower brine circulator, and two 15-horsepower refrigerator condenser circulating pumps.

Galley Equipment

The galley and pantries are electrified throughout. The equipment consists of ranges, bake ovens, electric griddles, toasters, hot plates, automatic electric dumb-waiters, dishwashers, and small electric appliances of various kinds.

All of the principal electrical equipment for the galleys and pantries is of the Edison Electric Appliance Company make.

Deck Auxiliaries

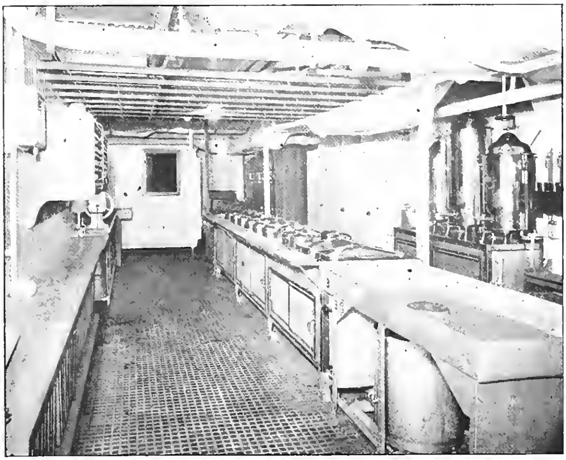
The deck and cargo handling auxiliaries, which are completely electrified with the exception of the anchor windlass, consist of four boat winches, three gypsies, and 26 cargo winches. The above deck cargo winches, of which there are 16, are of special interest because of their design features. They are of the single-geared type, and are capable of handling cargo at top speed continuously on loads up to 2000 pounds without exceeding the temperature limitations of the motor. On loads of 3000 pounds they can handle a total of 273 tons, or make 182 consecutive trips at top speed before the temperature of the motor reaches the limitation allowed in conservative practice. They can also make 40 consecutive trips (using a single whip) with loads of 6000 pounds within the temperature limitations. These 16 winches were supplied by the Lidgerwood Manufacturing Company.

The motor, although carrying the nominal rating of 25-horsepower at 310 revolutions per minute, has special windings. It was the result of an extended investigation into the subject of rapid cargo handling. On loads of 1500 pounds the accelerating forces of the rotating parts of the winch, motor, and load are so balanced as to accomplish the maximum amount of work with the minimum current consumption. Acceleration from rest to full speed is accomplished in slightly over a second's time and the functioning of the motor with the movement of the control handle takes place almost simultaneously. The elimination of the time lag between the two results is a very easy winch to handle. The control for the winches is of the full-automatic and magnetic type, and although the stevedore throws the control handle to the full-speed position instantaneously, the relays which are provided will prevent any heavy current surges on the line.

The winches are provided with automatic solenoid brakes, also a foot-operated band brake. The latter is used only in the case of an extremely heavy load. The retardation of a load when lowering is accomplished by dynamic braking; that is, the motor is used as a generator to retard the load to a very slow speed before the solenoid brake is applied. The 'tween-deck winches are of the usual double-geared type and use the same full magnetic type of control as is used for the above-deck winches.

Progressive Engineering

In a rapidly moving age it is the unusual that quickly becomes conventionalized. The same great uplifting forces that have changed our lives on land in the last decade are to take possession of the sea. This has been given its first impetus by far-sighted men who have the habit of looking bravely into the future. Criticisms for failure to follow the orthodox practices of a bygone age have no fears for them. The three magnificent vessels, the California, Virginia, and Pennsylvania, comprising the greatest tonnage of electric vessels in our merchant marine, will always remain as a permanent record in the history of progressive marine engineering.



Pantry in the tourist class accommodations on the Pennsylvania featuring many electrical appliances for short ordrs.

Puget Sound Workboat Notes

(Continued from Page 461)

yacht being built in the yards of the **Vancouver Shipyards Ltd.**, Vancouver, British Columbia, designed by L. E. Geary of Seattle. She will be of unique construction, being framed with heavy yellow cedar timbers, and diagonally planked on the inside with yellow cedar, and on the outside with heavy teak above the water line and fir below, making her a virtually rot proof job of the heaviest type.

Luxurious quarters for the owner and a spacious saloon will be located on the main deck, with five staterooms and three baths for guests below. Dining saloon, engine room, crew's quarters, and ample locker space occupy the space below. Twin 150-horsepower **Eastern Standard** diesel engines will be installed and fuel oil storage of about 3700 gallons. She is 107 feet overall length, 19 feet 4 inches beam, and 7 feet 6 inches draft, and will be equipped with **Sperry** navigation apparatus, and will cost approximately $150,000 to complete.

The largest and finest of the **Washington Navigation Company's** fleet of large diesel ferries, the **Skansonia,** named after Mitchell Skansie, president of the company, has been put on the short but heavily traveled run between Pt. Defiance (Tacoma) and Gig Harbor, after being completed in just under three months. The big new ferry is constructed throughout of the heaviest of fir timbers and planking, and was built and engined at the plant of the **Skansie Shipbuilding and Drydock Company** at Gig Harbor. She is rated as the finest in the fleet of five all-diesel ferries operated by the company and replaces the older steam ferry Gig Harbor, destroyed by fire in July of this year. The Skansonia is 165 feet long, 50 feet wide and draws 8 feet of water. Her power plant consists of twin 210-horsepower, 6-cylinder, **Fairbanks-Morse** diesels driving double end propellers. She has a capacity of 65 automobiles and 400 passengers and has a covered upper deck, an innovation on regular Puget Sound Ferries. A 27-cell **Edison** battery set charged from a dynamo operated off the flywheel of one main engine supplies light and power for the entire ship. A **Duro** water system is installed and an oil fired **Arcola** steam heating system. She makes an average speed of about 10 knots and is designed and built similarly to the Defiance, except for the shorter deck house. A completely equipped fountain lunch counter is installed in the main cabin.

PORT NOTES

The Vancouver Shipyard, Ltd., Vancouver, British Columbia, has been purchased by Duncan Bell-Irving, who will be president and general manager, and E. T. Rogers, who will be vice-president of the new Vancouver Shipyards (1929) Ltd.

The new owners plan improvements to the yard, including a new marine railway. H. Ramsden will continue as superintendent of the yard, having 60 to 80 men employed under him.

The **Victoria Terminal and Cold Storage Co., Ltd.**, has contracted with the Island Packing Company for the yearly shipment of 8,000,000 pounds of fresh fish from the new cold storage plant at Ogden Point, outer harbor, Victoria. This fish will be specially prepared, filleted, and packaged. It is expected that this contract will establish Victoria as the home port for about 150 trawlers.

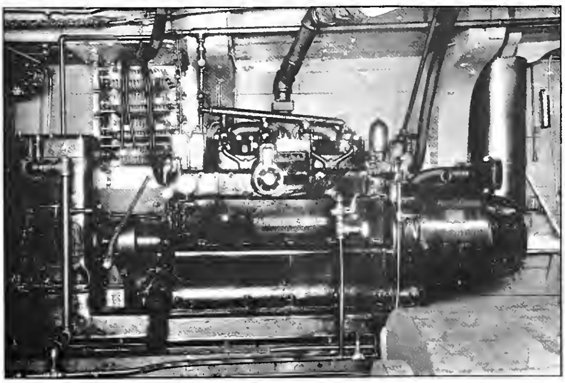
Bethlehem Shipbuilding Corp., Ltd., San Francisco, was low bidder recently for voyage repairs to the Army Transport Meigs to cost $7917.

More Motorboat Harbors Needed

At practically all ports of the Pacific Coast the demand for yacht mooring space and motorboat stalls is greater than the supply, and plans are on foot in many cities to create new yacht harbors or to greatly increase existing facilities. Long Beach, Alameda, Richmond, Oakland, and Portland are planning new facilities for the care of motorboats and pleasure craft. San Francisco, Los Angeles, and Seattle are faced with the necessity for greater enlargement and improvement of their existing yacht harbors.

An interesting phase of this development on the Pacific Coast is that the municipalities who have installed good yacht harbors find that these harbors are great dividend payers. The revenue from rentals and dues gives a good net surplus annually, and the indirect returns in attracting good business to the city are very noticeable.

There are a number of port projects on San Francisco Bay where a small outlay of municipal funds in a suitable yacht and motorboat harbor would not only prove a profitable investment from the standpoint of revenue but might mark the turning point in the history of the port projects by focusing the attention of the local boat lovers on the development.



Fairbanks-Morse auxiliary set for diesel motorships. Generating set with clutch connected compressor.

San Francisco Bay Shipping Directory

Pacific Marine Review

The National Magazine of Shipping

DECEMBER, 1929

Official Organ PACIFIC AMERICAN STEAMSHIP ASSOCIATION

Official Organ SHIPOWNERS' ASSOCIATION OF THE PACIFIC COAST

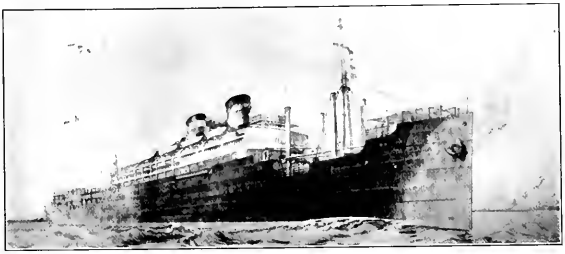
Pacific Marine Review

VOLUME XXVI | DECEMBER, 1929 | NUMBER 12

Shipbuilding Program Launched

First Ship now Afloat Heralds an Expansion in America's Foreign Trade Shipbuilding Program Which During the Past Sixty Days Has Raised Our Position From Seventh to Second Place Among the Shipbuilding Nations of the World

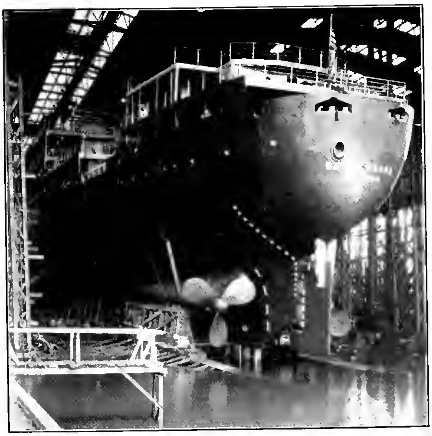
THE newly launched turbo-electric liner Santa Clara, building at the Camden yard of the New York Shipbuilding Company for the Grace Line of New York, is the first vessel afloat of the building program for American foreign trade ships initiated under the Merchant Marine Act of 1928.



Grace liner Santa Clara as she will appear when completed.

The Santa Clara has the following characteristics:

Length over-all	504'8"
Length between perpendiculars	482'9"
Beam molded	63'9"
Depth to upper deck	37'5"
Draft loaded	25'0"
Displacement, tons	16,000
Passenger capacity, first class	170
Freight capacity, tons	6900
Refrigerated freight capacity, cubic feet	6,000
Cooled air capacity, cubic ft.	9,000
Shaft horsepower, twin screw	12,600
Sea speed, knots	18



Stern view of the Santa Clara ready for launching.

The Santa Clara was designed especially for the West Coast of South America trade out of New York. She will have commodious public rooms and luxurious stateroom accommodations for her passengers. Every stateroom is an outside room; some have connecting sitting rooms and there are numerous private baths and showers.

The power plant consists of six oil-fired Babcock & Wilcox water-tube boilers of the latest interdeck incorporated superheater marine type. These are arranged in one fire room and will supply steam to two 4800-kilowatt General Electric turbo-generators direct-connected electrically to two 6300-shaft horsepower General Electric synchonous induction propulsion motors.

Practically all auxiliary machinery will be electrically operated. Power for this purpose and for lighting, heating, and cooling will be supplied by four 350-kilowatt, 240-volt, turbo-generating sets.

The following American manufacturers are supplying machinery, equipment, or furnishings toward the successful completion of the Santa Clara:

Propulsion machinery, switchboard, auxiliary turbo-generating sets, assisted draft blowers, motors, engine room ventilation sets, generator for emergency generating set, and balancer sets—by the General Electric Company.

Boilers, superheaters, feed water regulators, oil burners, and soot blowers—Babock & Wilcox Company.

Main and auxiliary condensers, external air coolers, air ejectors, and air compressors, centrifugal pumps—Ingersoll-Rand Company.

Feed water heaters, evaporators, distiller, and lubricating oil coolers—Davis Engineering Company.

R. Stanley Dollar

As vice-president and general manager of the Dollar Steamship Company, R. Stanley Dollar exercises a more world-wide directing force in shipping than does any other American shipping executive.

Steering gear, windlass, and warping winch—Hyde Windlass Company.
Fuel oil heaters, lubricating oil heaters, and filter for fresh water system—Griscom-Russell Company.
Pumps—Worthington Pump and Machinery Corporation.
Chain cable for bower anchors—National Malleable & Steel Castings Company.
Refrigerating machinery—Brunswick-Kroeschell Company.
Thrust bearings—Kingsbury Machinery Works.
Fire alarm system and fire extinguishing and smoke detecting apparatus—Walter Kidde & Co.
Fuel oil and lubricating oil strainers—Schutte & Koerting Co.
Life boats and davits—Welin Davit and Boat Corporation.
Lubricating oil separator—The Sharples Specialty Co.
Windows—Kearfott Engineering Co.
Gyro-compass and gyro-pilot equipment and searchlights—Sperry Gyroscope Co.
Pneumercator tank gauge system for fuel oil tanks—Harry S. Parks Co.
Sanitary fixtures—Mott Company of Pennsylvania.
Selbalith deck covering and rubber tiling—Selby Battersby Company.
Hull ventilation sets and ventilation heaters—Buffalo Forge Co.

Twenty-Five Years Ago

IN Pacific Marine Review for November 1904, the leading article was a very interesting transcript of the naval report on the burning of oil as fuel under the boilers of the American-Hawaiian steamer Nebraskan, which had then been in operation as an oil hurner for nearly two years. The atomizer used was the Lassoe-Lovekin oil burner, Lassoe being then superintending engineer for the American-Hawaiian Steamship Company, who collaborated with Luther Lovekin, chief engineer of Wm. Cramp & Sons Ship & Engine Building Company, in producing a practical apparatus for fuel oil combustion.The results of fuel oil burning are thus summarized in the naval report:

"The Nebraskan left New York August 7, 1902, touching at the ports of St. Lucia, British West Indies, and Coronel, for coal. She reached San Diego in fifty-seven days, five hours, and forty-three minutes. On that voyage 2267 tons of coal of poor quality were used, and a fireroom crew of fifteen men was found necessary. The ship was kept at full speed during the entire voyage.

On the voyage from San Diego to New York, with a greater cargo in her hold, the voyage was completed in fifty-two days, seven hours, and twenty-six minutes. There were consumed in the furnaces on this voyage 8826 barrels, or 1260 tons, of California fuel oil. Only six men were required in the fireroom. Their wages approximated $50 per month each.

On the outward passage from New York to San Diego the ship steamed 13,280 miles, while on the homeward passage between San Diego and New York the ship steamed 12,760 miles, the increased distance on the outward passage being due to the fact that the ship called at both St. Lucia and Coronel for coal.

Four hundred and fifty-seven tons of measured space for cargo was saved by reason of the oil fuel being of less bulk. The resulting financial gain to the company from all causes was at the rate of $500 per day. While five days were saved on the eastward journey, it must be remembered that that voyage was 520 miles shorter.

The insurance risks, both on the vessel and on the cargo, were not increased with the installation of liquid-fuel appliances. The underwriters made careful examination of the arrangements for storing the oil fuel, as well as the general character of the oil-burning installation, and after special investigation regarded the equipment as one not constituting an element of danger sufficient to demand higher insurance rates."

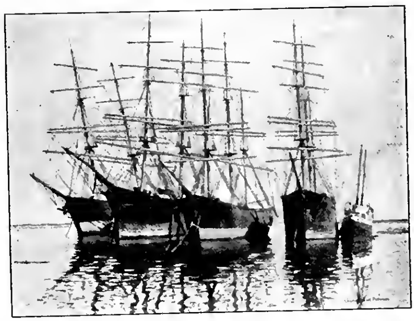
Under Editorial Correspondence, and also as a contributor, there appears for the first time the name of our old friend W. G. Tibbets of San Francisco.

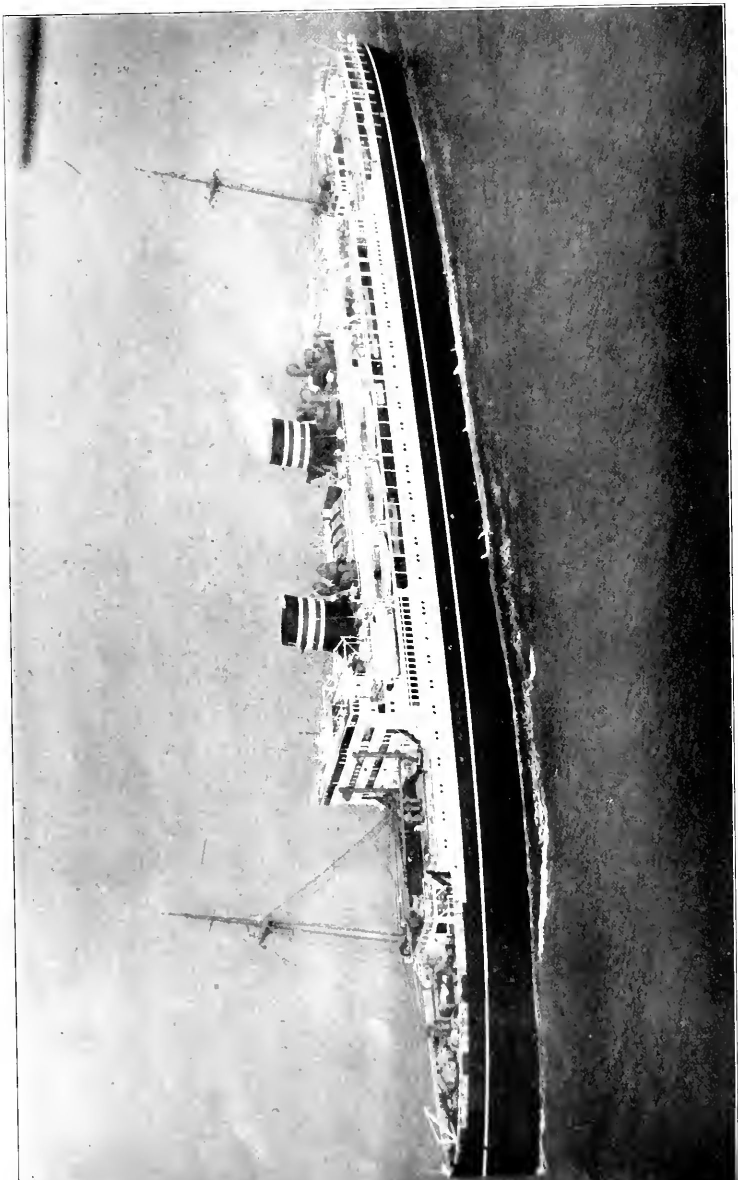
In the December 1904 issue there appeared a very interesting description of the Minnesota and Dakota, the first of which arrived at Seattle on her maiden voyage during that month. These vessels were owned by the Great Northern Steamship Company and were, at the time, the largest steamers on the Pacific Ocean. They were 630 feet long, 73 feet 6 inches beam, 57 feet molded depth, 38 feet draft, and of 38,800 tons loaded displacement. They carried 250 first-class, 166 third, and 1440 steerage passengers, and 22,800 tons of cargo.

Some very familiar names appear in their equipment list. Sterling water-tube boilers provided steam at 230 pounds pressure to a pair of Midvale Steel Co., 3-cylinder triples, 29 by 51 by 89 inches cylinder diameters and 57-inch stroke. At 78 revolutions these engines developed 5000 horsepower each and drove the hull through twin screws at 14½ knots. Katzanstein patent metallic packing was used on these engines. Cory mechanical telegraphs connected the engine room with the bridge. J. L. Mott Iron Works and A. B. Sands & Son Co. supplied plumbing fittings. Windlass and capstans were built by the Hyde Windlass Company. General Electric Company supplied the electric wiring and searchlights. Electric cargo winches were built by Lidgerwood. Coal and ash conveyors were designed and manufactured by the Link-Belt Company. Crane valves and pipe fittings were used, and Ashton safety valves and Crosby gauges.

All of these names still appear on the equipment lists of the great majority of the best new vessels in the American merchant marine.

Another item announces that "The Standard Oil Company is installing a fuel oil bunkering station of 55,000 barrels capacity at the Strait of Magellan."





The new Nippon Yusen Kaisha liner Asama Maru photographed from the air by the A. E. F. Photo Service, San Francisco, as she was leaving San Francisco Bay on her maiden voyage.

The New Japanese Motor Liner

The Asama Maru Creates Great Interest at California Ports on Her Maiden Appearance

Of all the great fleet of modern passenger liners and cargo carriers that have in recent years made their initial entrance through the Golden Gate, perhaps no single vessel has drawn so much interest and induced so much favorable comment as the Asama Maru, the long awaited motor passenger liner, first of a group of six building in Japanese shipyards for the Pacific Coast-Oriental service of the Nippon Yusen Kaisha. Three of these are for San Francisco service and three for Puget Sound service. These six vessels will cost well over $30,000,000.

The Asama Maru has the following characteristics:

Length over-all	584'0"
Length between perpendiculars	560 0"
Beam	72 0"
Depth	42 6"
Draft	28'6"
Gross tonnage	17,000
Passenger accommodations:	
First class	239
Second class	96
Third class	504
Propellers	4
Shaft horsepower, normal	16,000
Sea trial speed, knots	21

The passenger boarding the Asama Maru steps into a very spacious hotel lobby with luxurious furnishings and ornately decorated. At the forward end of this lobby is the purser's office, with large grilled counter, at the after end an easy stairway and an electric passenger elevator give access to decks above and below. This lobby is on B deck.

The main group of public rooms is arranged on A Deck and includes the library, a wide transverse foyer passageway, the grand lounge, two wide longitudinal galleries, the smoking room, another wide transverse foyer passageway, and the children's playroom opening on to the childen's play deck. This group of rooms is surrounded by a wide promenade with a splendidly laid teak deck finished at the edges with perfectly fitted removable teak gratings over the gutter. Low steel bulwarks capped by a heavy teak guard rail on top of which is mounted a teak hand rail supported by brass standards give this promenade a very pleasing appearance, which is greatly enhanced by the magnificent paint, or ra her enamel, job that some Japanese master craftsman has done on the steel work of the deck erections and the under side of the boat deck. These white surfaces appear to be porcelain enamel, as smooth as any mirror.

The decorations of the public rooms are carried out in splendid style by the famous interior decorators Waring and Gillow, of London. The library is furnished and decorated in the graceful William and Mary period style. The grand lounge follows the Georgian period, and the smoking room simulates an old English Tudor period tavern interior with heavily beamed ceiling and high English oak wainscot.

On the boat deck, reached by an easy stairway from the after foyer of the public rooms group is an outdoor veranda cafe in Spanish garden style that is one of the prettiest features we have seen on shipboard. Furn-

Two views of the N.Y.K. pier at San Francisco showing crowds on hand to welcome and inspect the Asama Maru. Over 50,000 persons were received on board at San Francisco and Los Angeles harbor. The Sunday crowd at San Francisco checked at 25,000. At Los Angeles 9000 people motored 20 miles to see this ship.

The smoking room on the Asama Maru, as shown above, is beautifully finished in oak paneling and beamed ceiling to simulate an old English tavern interior. At the left is shown an excellent view of the promenade deck. This liner has a larger promenade space per passenger than any other vessel on the Pacific Ocean. Generous provision is made also for open deck space for games entirely apart from the promenade deck.

ished with wicker tables and chairs, with imitation stone back-wall and with its sides open to the sea air, protected only by an iron balustrade, this is a real open air restaurant. Another very interesting and pleasing feature in this part of the ship is the Japanese room adjoining this veranda cafe. This is a replica of the main reception room of a Japanese gentleman's house. Here true native meals will be served with all due Nipponese ceremonial.

The dining saloon is located on D Deck and is a most magnificent apartment, beautifully decorated, and admirably arranged. The galley is located immediately aft of this room; and the second class dining room is aft of the galley on the same deck. The galley is very carefully laid out for convenience in preparing and serving meals. Ranges are oil-fired and there is much electrical equipment, among which we noted some Edison Electric Appliance Company ovens and other American made fittings.

On E Deck there is a splendidly equipped gymnasium, a Pompeian swimming bath, and dressing rooms.

The first class dining room, a corner of which is here shown, is a very spacious and beautifully decorated apartment. Its central portion rises through two decks to a finely molded dome decorated by famous English artists.

The second class public rooms decorated by Japanese artists in modified French and California Spanish style have an atmosphere of charming hominess that is very restful. This class should be very popular on this ship. In fact, while first class Asama Maru has all the appointments of a large modern metropolitan hotel of the finest type, second class Asama Maru simulates a small modern family hotel of the best class.

All first class and the great majority of second class staterooms are outside rooms. These accommodations include two magnificent suites de luxe on C Deck, consisting of reception room, bed room, dressing room, bath room, maid's room, valet's room, and baggage room. These suites are decorated in Japanese art of the Monoyama period adapted to the use of modern occidental furnishings by the well known Japanese firms Takashimaya and Kawashimaya of Kyoto. Without doubt these are the most elaborate and sumptuous apartments ever presented to transpacific passengers, and should be ranked high among the finest suites afloat.

All staterooms in first and second class are fitted with beds, with running hot and cold water, with electric heating, and with telephones. Many staterooms have private or communicating baths.

The third class passenger quarters are comfortable, clean and sanitary. Equipped with spring berths and with ample provision of lavatories, baths, and toilets, they appear to be far better furnished and more livable than the first-class accommodations we have seen on many old passenger steamers.

Ample provision is made for all the possible needs of passengers. Banks, barber shops, beauty shops, gift shops, a finely appointed bar, moving pictures, dispensary, hospital, telephones, baths, elevators, good dance music, games of many varieties, a splendid selection of books, radio connection with the entertainment of the world, and plenty of good food appetizingly prepared and served in beautiful surroundings—all these and many more features too numerous to detail here await the passenger on this modern transpacific motorship.

Ventilation is always a problem on large passenger vessels, especially when the route is through large climatic variety. On the Asama Maru the air in every compartment is completely changed every few moments by the well known Thermotank Punkah Louvre system, whereby the air may be either cooled, natural, or heated.

The machinery installation is completely described in another article in this issue.

The Asama Maru is a credit to her builders, the Mitsubishi Zosen Kaisha of Nagasaki, Japan, and to her owners and operators, the great Nippon Yusen Kaisha, and it is small wonder that they should be proud of this splendid motor vessel.

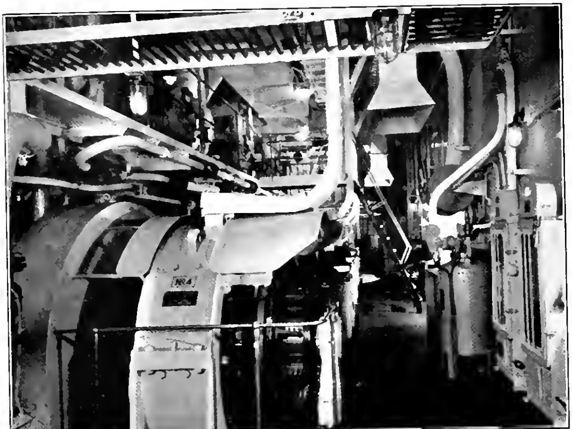
The New White Star Liners

THE White Star Line has recently issued an official statement to the effect that all work on their new 60,000-ton liner Oceanic is to be suspended as no decision has as yet been made regarding the ultimate design or type of propelling machinery to be installed. It has been definitely stated that electric drive is to be employed, but whether high speed airless injection diesels or high pressure watertube boilers and turbines are to be adopted for generating purposes is apparently still under consideration. The keel plates will, however, remain undisturbed in Harland & Wolff's Belfast shipyard, and work is to be started immediately on a new motor liner for the Liverpool-New York service, which will be a sister ship to the Britannic of about 27,000 tons gross and equipped with twin 10-cylinder, double-acting, 4-cycle, Burmeister & Wain diesels.

Meanwhile the work of fitting out the Britannic is being considerably delayed through a strike of joiners.

Machinery Installation of the Asama Maru

Sulzer Diesel Engines Provide Motive Power for New Japanese Passenger Liner



The auxiliary power plant of the Asama Maru is housed in a separate engine room.

NIPPON YUSEN KAISHA'S new motor passenger liner Asama Maru is truly an international product. Had one the space or time, it would be in order here to moralize interminably on the effect of the interchange of ideas and of trade in bringing about a better mutual understanding among the world's races.

Here is a Japanese-built hull propelled by engines built in the town of Winterthur, Switzerland, and shipped to Japan for installation in the vessel. She is steered by a hydro-electric gear built in Glasgow, Scotland, and this gear is controlled by an electric helmsman manufactured in Brooklyn, New York. Her galley derives electrical equipment from Chicago. Pennsylvania furnishes the purifiers to take care of her lubrication. New York protects her against fire. California equips her for navigation through fog. Could we trace all the various materials to their original sources, we would without doubt find practically every country on the globe contributing its bit to this splendid specimen of the shipbuilder's art.

The engine room of the Asama Maru is a very interesting power house. Her four 8-cylinder, single-acting, 2-cycle, directly reversible, Sulzer diesel engines, each developing 4125 brake horsepower and each directly connected to a propeller shaft, are set in line athwartship and fairly fill the engine room space. Scavenging air for these engines is supplied by three Brown Boveri electrically driven turboblowers, two of these being more than sufficient to take care of ordinary operation, leaving one for a stand-by.

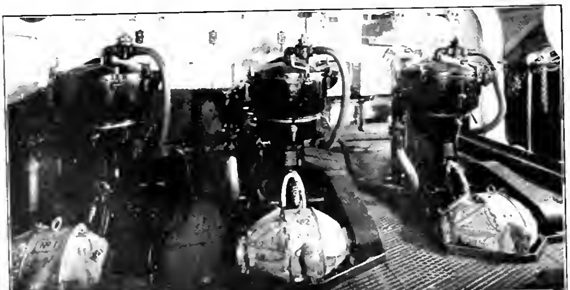
The Mitsubishi Zosen Kaisha, builders of the Asama Maru, are Japanese licensees for Sulzer Brothers of Winterthur, Switzerland. During the building of the engines for the Asama Maru, Japanese engineers and mechanics were stationed at Winterthur as observers and inspectors; and the engines for the second vessel will be built by Mitsubishi at their Nagasaki shops.

Control of these engines is centralized on the lower working platform at the forward end. As in all modern diesel practice, the operations necessary for starting, stopping, reversing and speed control are reduced to a very few simple movements with a hand lever and a hand wheel. The cylinder diameter is 680 milimeters, the stroke 1100 milimeters, and the engines develop full power at 115 revolutions, giving the vessel a sea service speed of 19 knots.

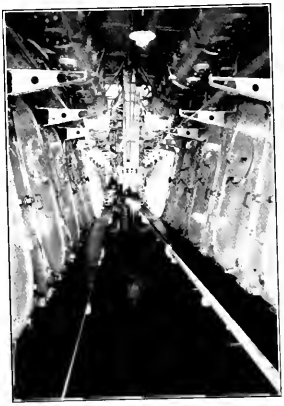
During trials on the measured mile, a speed of 21 knots was reached, the engines developing a total of 19,600 brake horsepower at 127.3 revolutions a minute. This is an overload of 23 per cent., and was maintained for several hours. During this overload trial and at all periods of operation, both on the trials and on her maiden voyage across the Pacific, no vibration was felt in the ship.

On the official trials, special tanks were fitted for measuring fuel consumption, which worked out at 0.38 pound per brake horsepower hour with Tarakan fuel oil. This is said to be the lowest fuel consumption yet recorded for diesel engines of similar design. In ordinary running at sea she uses about 72 tons of fuel oil a day for all purposes.

Cooling of pistons on these engines is by salt water, but an enclosed recirculating fresh water



A battery of three, vapor-tight, De Laval centrifugal separators insure clean fuel oil for the main and auxiliary diesel engines.



Three views in the main engine room of the Asama Maru. Upper, the cylinder head of the four main engines. Center, aisle between two engines showing crank case and inspection doors. Lower, view across forward end of the engine room on the lower working platform showing engine control.

system is used for the cylinders and heads. This works out very satisfactorily with the Sulzer design. Each engine is served by a pair of lubricating oil service pumps of the centrifugal type, each pair of pumps being driven by a single motor. One pump of each pair delivers oil to the low pressure lubricating system and the other delivers to the high pressure system.

Lubricating oil for the main engines is kept clean by two vapor-proof Sharples oil purifiers; and another pair of these machines is used for keeping the lubricating oil pure for the auxiliary diesels. Tatsumi Commercial Corporation, Japanese distributor for the Sharples Specialty Company, has a publicity man who uses natural imagery in a rather unique way in advertising this installation. He says, "Just as the human body requires clean blood, the engine requires clean oil. Human lungs clarify used blood, oil purifiers clarify used oil. The Asama's lungs are Sharples purifiers; therefore she is full of life and power." Associated lubricating oil is used for the engine cylinders.

Thrust of the propellers is taken by Sulzer-built thrust bearings of the single collar type. In the shaft alleys we were glad to note safety guards with an inspection hole over each coupling.

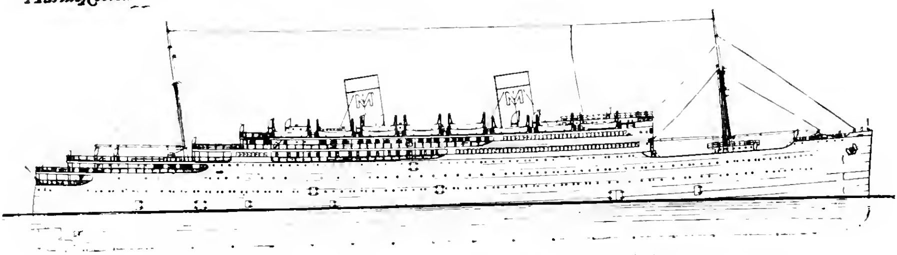
In the engine room wing spaces, port and starboard, are motor driven fire and bilge pumps, motor driven compressors, motor driven fresh water, sanitary, salt and fresh cooling water, fuel oil transfer, and other pumps, and large starting air tanks. The engine room bilges are protected against fire by a Foamite system piped under the floor plates.

Just forward of the main engine room forward bulkhead is a large compartment housing the auxiliary electric power plant. This consists of four 450-kilowatt Allen-Burmeister & Wain diesel-electric generating sets. These provide power for heating, cooking, lighting, and the auxiliary machinery all over the vessel. Among the large items of auxiliary power load are the three blowers for scavenging air for the main engines. Each of the motors operating these blowers has a full load capacity of 325 kilowatts. Two only are needed for the main engines and with the latter running at full normal load these two blowers will absorb about 700 horsepower. The refrigerating machinery, the ventilating motors, lighting, heating, cooking, and all pumps, in fact the full normal auxiliary power requirements at sea, can be easily taken care of by three of the generating sets, leaving one set as a stand-by.

There is a liberal provision in both engine rooms of 2-ton Yale & Towne chain blocks mounted on overhead rails for ease in handling weights. A nicely fitted up machine shop enables the engine room force to make emergency repairs and replacements at sea.

Fuel oil both for main engines and for auxiliary power engines is passed through centrifugal separa-

(Continued on Page 31, Blue Section)



Matson's New Passenger Liner

Bethlehem Shipbuilding Corporation, Fore River Plant, Building Two Express Passenger, 20-Knot, Geared Turbine Steamers for the San Francisco-Sydney Service of the Oceanic Steamship Company (Matson Line)

THE two new express passenger liners now building for the San Francisco-Sydney service of the Oceanic Steamship Company (Matson Line) present several notable features of design. They are under construction at the Fore River Plant of the Bethlehem Shipbuilding Corporation and are to be delivered in February and June of 1932.

Contracted for under the provisions of the Merchant Marine Act, 1928, these vessels will conform to rules and regulations of the highest class for the American Bureau of Shipping and the United States Steamboat Inspection Service and will also follow the proposed rules recommended by the International Conference of Safety of Life at Sea adopted at the London meeting last spring.

The principal characteristics are as follows:

Length over-all	632′0″
Length between perpendiculars	605′0″
Beam	79′0″
Depth to D Deck	44′6″
Draft	28′0″
Gross measurement (est.), tons	18,500
Horsepower of propulsion motors	22,000
Displacement at 28-ft. draft, tons	25,885
Guaranteed sea trial speed, knots	20½

The hulls will have nine decks, and will be divided into 16 watertight compartments with double bottom throughout. As will be noted in the outboard profile herewith, a cruiser stern has been adopted and a slightly raked stem. The subdivision arrangement is such that the vessel will float perfectly safely at sea with two of its largest adjacent compartments completely flooded. The design of these hulls is such that they are considered by experts to be as safe as the Matson liner Malolo.

Capacity will be provided for 5000 tons of dry cargo in holds and for 1000 tons of refrigerated cargo in six chambers, in addition to special compartments for mail and express freight, and a specially designed room for bullion shipments. One of the unusual features of the hull design is the extraordinary capacity for fuel oil; 7145 tons of bunker oil will be carried, which will be sufficient for fueling at San Francisco for the round trip, and will provide in addition a surplus of about 17,000 barrels.

Passenger Accommodations

Following the modern trend in passenger liner design, all of the first-class public spaces have been arranged on A Deck. These include library, writing room, lounge, theatre, smoking room, and veranda cafe. The promenade decks, of selected teak, have been designed as a special feature on both A and B Decks, and provide a larger area of open air promenade for passengers than any American ship yet built. Special provision has been made for outdoor sports. The boat deck will have a regulation size tennis court over the dome of the social hall. Two outdoor swimming tanks of similar construction are provided to be built into the ship; the first-class swimming pool forward and the tourist swimming tank aft. Adjacent to each of these tanks dressing rooms and toilet facilities will be fitted.

The first-class dining saloon is located on E Deck and will have a seating capacity of 412 at small tables. Tourist dining saloon is located on E Deck aft and seats 128. Both of these rooms are to have special forced ventilation fitted for supplying cooled air by forcing the air over refrigerated coils and through the regular ventilating system. These rooms will be specially insulated to further insure comfortable temperatures while going through the tropics.

One large galley is to be provided between these two dining rooms on E Deck. This will be fitted with the most modern equipment for electrical cooking—ranges, roasters, electric grill, electric bakery, electric mixers, electric cutting and slicing machines.

Tourist public rooms will consist of a large lounge, smoking room, and writing room. As in the first-class public spaces, the tourist promenade spaces have more area per passenger than any American ship afloat. All of the latest deck games will be provided for both classes of passengers.

In staterooms, the design calls for accommodating 620 first-class passengers, 572 of whom will be provided with beds and day beds. Contemplating the possible use of these vessels for first-class special cruises, a number of tourist-class cabins will be furnished with the same class of beds and fittings as are used for the first-class rooms. By the opening of certain alleyway doors, these rooms can be thrown into the first-class accommodations.

Provision is to be made for 217 tourist-class passengers, of which 137 can be easily converted to first-class. All first-class staterooms are arranged above E deck and, with the exception of a few inside rooms amidships, all first-class rooms are

exceptionally large and are arranged as outside rooms with port lights or windows to the outside air. None of these rooms are of the so-called bibby type, where the room is really an inside room with an alleyway reaching to the port light. All staterooms are to be fitted with extra large twin beds having mattresses 36 inches wide by 6 feet 6 inches long.

The floors of all first-class and tourist-class staterooms and all alleyways, the dining saloon, the smoking room, and other public spaces will be covered with rubber tile, the coloring to be suitable to the interior decorative design. Over this rubber tile, in the staterooms and public spaces, will be laid loose rugs. This combination should have a decidedly cooling effect and lends itself to sanitation and cleanliness in passenger accommodations.

Every first-class and tourist stateroom is provided with a private telephone connecting with a central station installed adjacent to the ship's office.

Two electrically operated elevators for first-class passenger accommodation serve all decks, and an electrically operated baggage elevator serves the large baggage room and makes possible easy access to and careful handling of passengers' trunks.

Careful attention has been paid to the ventilation of the entire ship. The thermo-tank system is being specified and is to be arranged for the circulation of either natural, cooled, or heated air.

Plumbing arrangements on these vessels are especially elaborate. Every first-class stateroom in the ship is provided with private toilet and every room has either private bath, private shower, or connecting bath, all served with hot and cold fresh water. Every room in the tourist class is provided with a lavatory and hot and cold running water. Some of the tourist rooms have connecting baths. Throughout both classes there are large numbers of public baths and toilets provided.

Special provision is made to take care of all the needs of passengers. This provision includes a fully equipped laundry, with ample capacity to take care of passenger and ship needs throughout the voyage. There will be a passenger tailor shop and novelty shop, two beauty parlors, two barber shops, and a completely equipped gymnasium with electric cabinet baths, and children's playroom; a specially constructed moving picture booth with complete equipment provided to show "talkies"; a complete broadcasting system, so that public addresses and musical programs from the ship or shore can be transmitted to several of the public rooms in both classes. A complete printing plant is provided so that the ship may publish its own newspaper each day.

Propulsion Machinery

The main propulsion machinery will consist of twelve water-tube boilers designed to provide steam at a pressure of 350 pounds per square inch, superheated to a total temperature of 6000 degrees Fahrenheit. This steam will be used in two sets of triple expansion turbines, each set operating through single reduction gearing to a propeller shaft. The boilers will be arranged in two separate water-tight compartments with separate stacks and with arrangement for working with closed fire rooms under forced draft.

The turbine machinery will have a capacity of 22,000 normal horsepower and a maximum capacity of 25,000 shaft horsepower.

For providing auxiliary electrical power and light, four 500-kilowatt steam turbo-generating sets will be installed. These will be located in an auxiliary engine room space entirely separate from the main propelling machinery spaces. All auxiliary machinery, pumps, blowers, fans, steering gear, windlass, cargo winches, capstans, all cooking, and all stateroom heating will be electrically operated.

These ships, when completed, will compare favorably with the finest ships afloat.

Hamburg-American Line Motorship Oakland

ARRIVING November 16 on her maiden voyage, the Hamburg-American freight and passenger liner Oakland created considerable interest at San Francisco and had a great reception November 19 at the Port of Oakland on the east side of San Francisco Bay, where she was thrown open for public inspection after an official welcome by the city authorities.

Oakland is fifth in a series of seven notable vessels built or on order by the Hamburg-American Line for its direct Pacific Coast and North Europe service. She was built at the Deutsche Werft, Hamburg, and engined by the General Electric Company of Hamburg with their new 2-ycle, double-acting, airless injection diesel. This diesel is known as the A.E.G., from initials of the German words that make up the firm name.

The principal characteristics of the vessel are:

Length	430 feet
Beam	59 feet
Depth	38 feet
Shaft horsepower	4800
Speed at sea, knots	14
Gross tonnage (about)	6,800
Displacement tonnage (about)	14,000
Cargo deadweight tonnage (about)	9,500
Refrigerated capacity (about), tons	1,000
Passenger Accommodations:	
First class	26
Third class	24

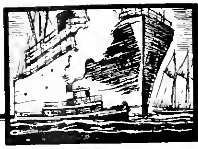
The first class accommodations for passengers on these vessels are roomy, well lighted and ventilated, and very tastefully and comfortably furnished. All staterooms have running hot and cold water, and several have private bath and toilet. The public rooms, dining saloon, promenade and game spaces on deck are ample for the full capacity passenger list. Galley and pantry service are excellent; and passengers on these vessels should certainly have a delightfully restful and enjoyable five weeks at sea and in ports of call between Hamburg and Pacific Coast ports.

Third class accommodations are very comfortable; and offer everything that was to be found in first-class on such ships 10 to 15 years back.

The Oakland differs from her sister motorships of this Hamburg-American Line service mainly in the propelling engines and in the steering gear. Her propulsion plant consists of a 6-cylinder, 2-cycle, airless injection, double-acting A.E.G. diesel engine directly connected to the propeller shaft and developing 4800 brake horsepower at 90 revolutions per minute.

This engine is new on the Pacific Coast, and that on the Oakland

(Continued on Page 25, Blue Section)



Trade, Traffic, and Shipping

International Trade in Wool

A Resume of the Growth in Transport of, and Commerce in, the Various Grades of Wool which Should be of Peculiar Interest to Pacific American Ship Operators in the Present Revival of Pacific Coast Sheep Industry

IMPORTS and Exports, United States.—Increased supplies of needed wool have been furnished by imports. These have shown a decided increase over the past forty-one years. The area between the lines of trend in figures 34 and 35 give some indication of the necessity for these imports. Imports fluctuate from year to year, a year of small offerings from foreign countries usually being followed by one or two of large imports (tables 80 and 82).

During the past eighteen years there has not been a pronounced shift in the percentages of either clothing and combing or carpet wools imported, except that the war years brought about a noticeable increase in the imports of the first-mentioned class of wool. Following the war carpet wools again increased in the relative volume reported.

Since the United States is on an import basis, it is natural to expect that exports of domestic raw wool would be small. This has been the case for a number of years, although during certain years re-exports of foreign wool were considerable.

Practically all of the wool entering the United States is sent through the customs districts of the Middle Atlantic and New England States, little or none being sent via those of the Pacific Coast. Foreign wool is often unloaded at San Francisco, placed in bond, and usually shipped to Boston or Philadelphia. These imports are entered in the customs receipt of the Atlantic seaboard cities. In 1927 over 61 million pounds of wool were handled through Pacific Coast ports (San Francisco 53.5 per cent, Portland 38.1 per cent), most of this trade being represented by shipments billed for north and middle Atlantic ports. In this connection it is interesting that west of an irregular line running through Montana, Idaho, Utah and Arizona, the rail and water rate justifies producers shipping via Pacific Coast Ports and the Panama Canal.

Origin of Imports.—Almost every section of the globe contributes to the imports of wool received by the United States (table 80). Since the war the principal sources of such imports have been Australasia (Australia and New Zealand), China, Argentina, the United Kingdom, and British India. Imports show a trend toward increased purchases in the primary wool markets rather than at the London Sales. The proportion of wool imported from Great Britain in the last few years has been considerably below that of the pre-war average. The proportions of imports direct from Australia has been about double the pre-war percentage. There are decided differences in the types of wools exported to the United States from the different countries. Australia, Argentina, New Zealand, Uruguay, and the United Kingdom send the bulk of the combing wools, while China, British India, the United Kingdom, Palestine and Syria have been shipping the largest amounts of carpet wools. Clothing wool is shipped primarily by those countries sending combing wool.

Owing to changes in the designation of wools entering the country it is almost impossible to follow the present grouping with the exception of carpet wools over a long period of years.

Imports and Exports of Wool Manufactures.—In addition to the large imports of raw wool, considerable

TABLE 80

WOOL IMPORTED INTO THE UNITED STATES BY PRINCIPAL COUNTRIES OF ORIGIN AND PERCENTAGE IMPORTS, 1913–1928†

(Thousands of pounds, i.e., 000 omitted)

Fiscal year	Oceania	China	Argentina	United Kingdom	British India	British South Africa	Turkey	Russia	All other countries	Total
1913	31,853	35,572	26,743	19,330	10,212	•	15,457	24,695	12,681	180,262
1914	64,698	31,078	42,277	22,024	14,150	•	10,358	22,845	14,141	236,081†
1915	75,866	36,718	77,808	16,447	2,120	•	4,730	2,290	40,952	273,558
1916	121,361	47,435	129,163	23,326	11,506	78,430	331	3,310	24,122	448,494
1917	1,772	30,471	207,970	2,575	450	31,970	10		37,288	350,108
1918	32,367	26,880	181,155	139	54	61,027		3,124	31,750	354,904
1919	93,033	40,243	139,452	2,039	4,920	57,566	129	1,583	42,244	422,415
1920	75,809	32,161	139,602	13,979	8,641	49,636	9,543	4,890	46,139	427,578
1921	68,880	26,012	104,023	16,264	536	25,933	3,339	1,026	36,036	318,236
1922	43,775	68,455	34,020	23,665	29,561	8,769	2,788	1,182	19,333	255,087
1923	141,868	67,360	96,977	45,635	28,739	27,124	11,154	4,306	53,667	525,473
1924	59,452	59,297	31,339	24,132	14,290	6,513	6,961	41	29,159	239,122
1925	62,739	58,201	34,781	24,713	29,247	6,184	5,078	527	42,505	284,706
1926	96,598	36,478	46,027	31,169	22,051	22,331	2,315	1,887	46,558	345,513
1927	58,455	37,513	28,812	33,696	25,612	6,535	8,401	2,634	51,422	270,905
1928	47,526	57,699	24,327	23,277	24,969	6,250	5,526	126	58,490	248,190
PER CENT OF TOTAL IMPORTS										
1913	17 7	19 7	14 8	10 7	5 7	•	8 6	13 7	7.0	....
1914	27 4	13 2	17 9	9 3	6 0	•	4 4	9 7	6 0	....
1915	27 7	13 4	28 4	6 0	0 8	•	1 7	0 8	15 0	....
1916	27 1	10 6	28 8	5 2	2 6	17 5	0 1	0 7	5 4	....
1917	0 5	8 7	59 4	0 7	0 1	9 1	•	•	10 7	....
1918	9 1	7 6	51 0	0 0	0 0	17 2	•	0 9	9 0	....
1919	22 0	9 5	33 0	0 5	1 2	13 6	0 0	0 4	10 0	....
1920	17 7	7 5	32 7	3 3	2 0	11 6	2 2	1 1	10 8	....
1921	21 6	8 2	32 7	5 1	0 2	8 2	1 1	0 3	11 3	....
1922	17 2	26 8	13 3	9 3	11 6	3 4	1 1	0 5	7 6	....
1923	27 0	12 8	18 5	8 7	5 5	5 2	2 1	0 8	10 2	....
1924	24 9	24 8	13 1	10 1	6 0	2 7	2 9	0 0	12 2	....
1925	22 0	20 4	12 2	8 7	10 3	2 2	1 8	0 2	14 9	....
1926	28 0	10 6	13 3	9 0	6 4	6 5	0 7	0 6	13 5	....
1927	21 6	13 9	10 6	12 4	9 5	2 4	3 1	1 0	19 0	....
1928	19 1	23 2	9 8	9 4	10 1	2 5	2 2	0 1	23 6	....

• Included in all other countries

† From 1914 on imports of mohair, alpaca, etc are included The above table is apt to be confusing to the reader if an analysis of the data is attempted The gross imports are a mixture, not only of different wool classes but of the classes of wool in varying conditions. In the following table (81) the items followed by a cross (x) are included in the totals for 1927, 1928, and 1929 It will be noted that in these totals are included wool on the skin or in the grease, in the grease and washed, and scoured These differences account for the seeming discrepancies between the above table and table 82 for the years 1913-1918. It is difficult to list imports so that the yearly data will be comparable.

Source of data Nat Assoc. of Wool Mnfrs. Wool imported into the United States. Ann. Wool Rev. 1928 156. 1929.

TABLE 81

IMPORTS OF WOOL FOR THE FISCAL YEARS 1927–1929

(thousands of pounds, i.e., 000 omitted)

Class	1927	1928	1929
Carpet			
On skin or in grease — free	12,346 x	8,119 x	17,718 x
On skin or in grease — dutiable	85,659 x	95,952 x	103,721 x
Washed or scoured — free	7,642 x	5,083 x	5,058 x
Washed or scoured — dutiable	39,051 x	36,331 x	38,216 x
Clothing			
In the grease and washed:			
Actual weight	16,268 x	18,741 x	17,291 x
Clean content—dutiable	9,906	10,837	9,637
Scoured—dutiable	502 x	635 x	1,116 x
Combing			
In the grease and washed:			
Actual weight	101,715 x	78,783 x	81,976 x
Clean content dutiable	61,267	47,723	48,570
Scoured dutiable	1,193 x	1,499 x	1,502 x
Hair of the Angora goat, Alpaca, etc., and mohair:			
Actual weight	6,547 x	2,204 x	3,291 x
Clean content dutiable		1,628	2,371
Hair of the Cashmere goat			
Actual weight	205 x	686 x	1,204 x
Clean content dutiable		465	828
Totals	271,128	248,033	271,093

x Included in totals

TABLE 82

GROSS IMPORTS OF WOOL BY CLASS, UNITED STATES, 1913–1929

(Thousands of pounds, i.e., 000 omitted)

Fiscal years	Carpet, class III	Clothing, class I	Clothing,* class II	Total
1913	111,168	67,239	16,886	195,293
1914	102,003	125,089	20,557	247,649
1915	65,710	222,017	20,356	308,083
1916	109,269	403,122	22,437	534,828
1917	67,673	279,482	25,218	372,372
1918	58,995	303,869	16,266	379,130
1919	84,178	327,945	10,292	422,415
1920	72,226	337,212	18,140	427,578
1921	50,065	251,562	16,608	318,236
1922	148,787	32,821	73,479†	255,087
1923	171,879	43,703	309,890†	525,473
1924	118,375	12,820	107,927†	239,122
1925	138,461	24,446	121,800†	284,706
1926	118,080	16,663	210,771†	345,513
1927	144,699	16,777	109,428†	270,905
1928	145,485	19,376	83,152†	248,033
1929	164,712	18,407	87,974†	271,093

* Includes mohair, etc.

† This total includes wools not covered by the designation, class II wools, in the earlier tariff laws.

Sources of data: 1913-1927, Nat. Assoc. Wool Manfrs Gross imports of wool, Ann Wool Rev 1927 166 1928 1928, 1929 U S Dept Com to authors.

quantities are imported in various manufactured articles such as cloth, tops and yarns, wearing apparel, carpets, rugs, etc. The value of such imports in 1927 was $62,396,620. The value of exports of manufactured material has amounted to approximately 10 per cent of the imports during the past five years.

The World Trade in Wool.—With the bulk of the wool produced in the more sparsely settled sections of the globe and utilized in the densely populated areas, there necessarily has developed a world-wide trade in this commodity. Over one-half of the world's present supply of wool is produced in the southern hemisphere. Approximately two-thirds of all the wool produced is sent to other countries from the nation in which it originates, there to be utilized in manufacture. The largest exporters of wool are Australia, Argentina, New Zealand, Union of South Africa, Uruguay, China and British India.

The largest amounts of wool are consumed in the highly industrialized nations of western Europe and the United States. Italy, Czecho-Slovakia, Poland, and Russia also purchase considerable quantities of this commodity. In the far east the industrialization of Japan has caused imports to rise at an almost phenomenal rate; imports for 1927 indicating an increase of 483 per cent over the pre-war average imports of wool. In the latter country this wool is not being imported entirely for consumption, but to a certain extent for manufacture and re-export. The notable failure of the United States and Europe to increase their demand for wool in proportion to the increase in supply would have resulted in considerably lower prices had it not been for radical changes in the habits of consumers in the Orient. The general adoption of western dress in Japan has enormously stimulated the consumption of wool.

The illustrations and figures in this article are taken from a report on "Economic Aspects of the Sheep Industry," published October, 1929, by the Agricultural Experiment Station of the University of California.

A Very Busy Northwest Waterway

We present here an interesting airplane view (taken by Brubaker Aerial Surveys of Portland, Oregon) showing the Lake Washington ship canal which connects Salmon Bay with Lake Union and Lake Washington, passing through the heart of Seattle. The Ballard Locks, shown in lower center, are said to be second in size only to the Panama Canal locks. During 1928, over 40,000 craft were passed through these locks. Commerce on Lake Washington has already far surpassed the almost impossible predictions made when these locks were built.

America's Foreign Trade and Its Ships

ALPHABETICAL INDEX OF FOREIGN COUNTRIES, WITH TOTAL IMPORTS FROM AND EXPORTS TO EACH

(IN CARGO TONS OF 2,240 POUNDS)

Country	Imports	Exports	Total Commerce
Aden	9,398	4,341	10,739
Algeria	402,987	113,795	516,782
Anglo Egyptian Sudan	8,185	811	8,996
Angola	35	7,256	7,291
Antigua	1,873	4,068	5,941
Arabia	754	3,354	4,108
Argentina	856,538	1,976,624	2,833,162
[illegible]	-	124	124
Australia	50,564	1,332,358	1,382,922
Azores	388	13,966	14,354
Bali	-	1,916	1,916
Barbados	8,836	65,675	74,511
Belgian Congo	15,759	14,737	30,496
Belgium	[illegible]	[illegible]	[illegible]
Bermudas	10,497	[illegible]	[illegible]
Borneo	5,227	27,637	32,864
Brazil	775,479	954,449	1,729,928
British Honduras	96,706	15,272	111,978
British North Borneo	1,045	-	1,045
Buen Ayre	[illegible]	-	76
Bulgaria	45	-	45
Cameroons	1,199	7,546	8,745
Canada	5,178,610	11,212,696	16,391,296
Canal Zone	178,[illegible]	[illegible]	[illegible]
Canary Islands	204	[illegible]	[illegible]
Cape Verde Islands	169	32,057	[illegible]
Cayman Brac	-	35	35
Celebes	25,169	9,396	34,565
Ceylon	69,752	47,474	[illegible]
Chile	[illegible]	943,034	[illegible]
China	151,278	1,149,220	[illegible]
Colombia	1,570,277	282,436	[illegible]
Cook Islands	1,258	633	1,891
Costa Rica	185,047	41,230	226,277
Cuba	4,577,345	2,146,925	[illegible]
Curacao	947,446	96,636	1,044,082
Cyprus	3,879	126	4,004
Dahomey	2,284	4,841	9,725
Danzig	11,778	153,634	165,412
Denmark	34,074	834,571	868,645
Dominica	2,311	1,323	[illegible]
Dominican Republic	174,791	147,421	322,612
Ecuador	53,879	38,468	92,347
Egypt	68,538	139,144	207,682
England	3,193,920	6,986,336	[illegible]
Eritrea	750	3,200	3,950
Faeroe Islands	1,211	-	1,211
Fanning Island	335	378	713
Fernando Po Island	-	1,322	1,322
Fiji Islands	4,412	7,587	11,999
Finland	106,977	116,697	[illegible]
France	528,026	2,373,815	2,901,841
French Guinea	61	1,832	1,893
French Indo-China	137	27,053	[illegible]
French Somaliland	162	1,257	1,419
Gabon	60	3,110	3,170
Gambia	-	2,349	2,349
Germany	1,049,650	3,862,105	4,911,755
Gibraltar	1,515	1,768	3,283
Gilbert Islands	503	-	503
Gold Coast	85,426	59,895	145,321
Grand Cayman	1	224	225
Great [illegible] Island	224	32	160
Great Inagua	-	78	78
Greece	39,382	237,917	277,299
Greenland	4,900	-	4,900
Grenada	2,943	3,643	6,556
Guadeloupe	118	14,422	14,540
Guatemala	209,947	136,784	346,731
Guiana, British	166,304	26,287	192,591
Guiana, Dutch	177,220	22,704	199,924
Guiana, French	9	1,729	1,738
Haiti	37,370	104,271	139,641
Honduras	621,752	154,920	776,672
Hong Kong	111,257	315,063	426,320
India	719,126	280,084	999,210
Iraq	23,592	-	23,592
Ireland	6,402	393,734	398,136
Italy	434,742	1,608,352	2,043,094
Ivory Coast	18,335	7,294	25,629
Jamaica	310,943	164,071	475,014
Japan	311,871	4,458,136	4,770,007
Java	134,290	195,223	329,513
Jugoslavia	20,620	3,234	23,854
Kenya	67	19,138	19,205
Latvia	-	27,653	27,653
Liberia	342	6,338	6,680
Lithuania	2,711	5,737	8,448
Madagascar	-	7,967	7,967
Maderia	8	6,828	6,836
Malta	202	11,617	11,819
Marquesas Islands	71	380	451
Martinique	604	144,840	145,044
Mauritius Island	41	10,432	10,473
Mexico	4,604,661	484,597	[illegible]
Miquelon	-	568	568
Montserrat	33	67	100
Morocco	34,033	50,437	84,470
Mozambique	141,613	95,165	236,778
Netherlands	728,512	2,671,189	3,397,701
New Caledonia	9,340	5,996	15,336
Newfoundland	261,198	126,975	388,173
New Guinea	5,258	4,049	[illegible]
New Hebrides	1,403	-	1,403
New Providence	6,577	34,310	40,887
New Zealand	50,460	476,004	526,464
Nicaragua	109,451	52,116	161,567
Nigeria	53,426	62,230	115,656
Niuafou	569	-	569
Niuafobutabu	528	-	528
Norway	254,580	304,253	558,833
Orube	2,416,756	33,336	2,450,098
Palestine	185	7,699	7,884
Panama	43,329	16,473	59,802
Persia	1,837	-	1,807
Peru	223,420	278,390	501,810
Philippine Islands	942,146	590,405	1,532,534
Portugal	37,526	93,383	130,909
Portuguese Guinea	-	956	859
Reunion Island	-	1,126	1,126
Rumania	1,049	16,929	20,978
Saint Christopher	1,609	4,323	5,932
Saint Croix	7,905	1,534	9,434
Saint Eustatius	42	-	42
Saint Helena	-	116	116
Saint Lucia	9,276	17,429	25,705
Saint Pierre-Miquelon	12	5,588	5,596
Saint Thomas, Africa	-	697	697
Saint Thomas, Virgin Islands	194	174,403	174,597
Saint Vincent	1,126	2,411	3,537
Salt Cay	1,600	-	1,600
Salvador	6,653	51,236	57,889
Samoa Islands	10	2,345	2,355
Scotland	130,785	594,602	725,387
Senegal	2,053	30,699	32,752
Siam	555	6,024	6,579
Sierra Leone	1,161	10,312	11,473
Society Islands	10,579	8,604	19,183
Solomon Islands	2,402	-	2,408
South Georgia	11,778	16,734	28,514
South Shetlands	3,600	-	3,600
Southwest Africa	690	6,098	6,788
Spain	349,286	691,334	1,040,634
Straits Settlements	327,001	116,361	443,362
Sumatra	58,973	37,319	97,312
Sweden	478,424	641,569	1,119,953
Syria	4,068	18,623	22,691
Tanganyika Territory	7,609	4,990	12,599
Tasmania	203	14,609	14,812
Togo	211	6,215	6,426
Tonga Islands	-	322	322
Trinidad	224,079	98,667	322,742
Tunisia	87,632	17,702	105,334
Turkey	37,772	19,863	53,635
Turks Island	14,340	1,860	16,200
Union of South Africa	35,076	316,236	351,302
U. S. S. R. (Russia)			
In Asia	525	3,953	4,480
In Northern Europe	13,600	119,844	133,444
In Southern Europe	202,159	47,127	249,386
Uruguay	39,063	472,907	511,970
Venezuela	2,365,196	188,628	2,553,824
Wales	139,586	158,074	298,660
Washington Island	1,100	58	1,158
TOTAL	41,945,676	55,386,131	97,331,807

NUMBER, NATIONALITY AND DEADWEIGHT TONNAGE OF VESSELS ENTERED AND CLEARED UNITED STATES PORTS IN FOREIGN TRADE FISCAL YEAR ENDED JUNE 30, 1928

(INCLUDES ONLY VESSELS OF 100 GROSS TONS AND OVER)

	Entrances						Clearances					
	Total		Loaded		Ballast		Total		Loaded		Ballast	
	No. of Vessels	Deadweight Tonnage	No. of Vessels	Deadweight Tonnage	No. of Vessels	Deadweight Tonnage	No. of Vessels	Deadweight Tonnage	No. of Vessels	Deadweight Tonnage	No. of Vessels	Deadweight Tonnage
AMERICAN												
United States Shipping Board	1,228	10,906,744	1,086	9,659,851	142	1,246,893	1,196	10,602,865	1,191	10,552,165	5	50,700
Privately Owned	9,993	43,700,316	6,068	30,521,874	3,925	13,178,442	10,217	44,642,653	6,122	25,703,409	4,095	18,939,244
Total American	11,221	54,607,060	7,154	40,181,725	4,067	14,425,335	11,413	55,245,518	7,313	36,255,574	4,100	18,989,944
FOREIGN												
Argentina	1	10,320	-	-	1	10,320	1	10,320	1	10,320	-	-
Belgium	94	887,259	66	618,137	28	269,122	95	887,803	95	887,803	-	-
Brazil	46	400,048	46	400,048	-	-	45	394,500	45	394,500	-	-
Chile	14	84,489	14	84,489	-	-	16	97,568	16	97,568	-	-
Colombia	2	5,750	2	5,750	-	-	4	6,662	4	6,662	-	-
Cuba	17	42,400	16	41,600	1	800	16	41,600	-	-	16	41,600
Danzig	57	748,890	14	184,132	43	564,758	56	734,606	43	560,772	13	173,834
Denmark	502	2,599,104	424	2,046,721	78	552,383	504	2,637,270	391	2,178,996	113	458,274
Estonia	1	700	-	-	1	700	-	-	-	-	-	-
Finland	3	18,350	2	10,870	1	7,480	3	18,350	1	7,480	2	10,870
France	344	2,996,160	207	1,883,332	137	1,112,828	346	3,018,846	341	2,977,416	5	41,430
Germany	457	3,678,376	354	2,924,799	103	753,577	474	3,781,857	437	3,580,117	37	201,740
Great Britain	10,774	44,895,445	6,312	26,132,191	4,462	18,763,254	10,807	45,341,227	7,668	37,362,377	3,139	7,978,850
Greece	23	174,643	13	89,570	10	85,073	25	186,868	24	181,368	1	5,500
Honduras	629	1,890,758	623	1,877,560	6	13,196	629	1,897,128	460	1,453,221	169	443,907
Italy	384	3,380,959	259	2,261,003	125	1,119,956	395	3,479,352	347	3,062,691	48	416,661
Japan	573	5,412,655	320	3,088,509	253	2,324,146	588	5,540,640	566	5,329,835	22	210,805
Mexico	38	106,872	34	95,460	4	11,412	39	114,334	29	75,512	10	38,822
Netherlands	422	3,182,006	315	2,327,776	107	854,230	428	3,247,407	383	2,981,992	45	265,415
Nicaragua	175	170,100	173	169,380	2	720	176	169,560	81	108,360	95	61,200
Norway	2,111	9,212,220	1,779	7,178,766	332	2,033,454	2,130	9,305,642	1,250	6,077,413	880	3,228,229
Panama	122	281,852	121	279,852	1	2,000	125	285,772	88	246,749	37	39,023
Peru	8	39,196	7	36,147	1	3,049	8	39,196	7	36,696	1	2,500
Portugal	5	28,696	4	19,096	1	9,600	5	28,496	5	28,496	-	-
Spain	113	660,645	95	558,190	18	102,455	111	652,581	108	635,254	3	17,327
Sweden	350	2,232,159	309	1,935,471	41	296,688	356	2,298,084	298	1,712,493	58	585,591
U. S. S. R. (Russia)	-	-	-	-	-	-	3	6,453	3	6,453	-	-
Venezuela	6	18,495	6	18,495	-	-	4	12,933	2	6,130	2	6,803
Total Foreign	17,271	83,158,547	11,515	54,267,344	5,756	28,891,203	17,389	84,235,055	12,693	70,006,674	4,696	14,228,381
TOTAL - All Countries	28,492	137,765,607	18,669	94,449,069	9,823	43,316,538	28,602	139,480,573	20,006	106,262,248	8,796	33,218,325

A Busy Columbia River Port

Longview-Kelso, Home of Two of the World's Greatest Lumber Mills, is One of the Fastest Growing Ports in the Northwest

RARELY in the history of modern times have the growing pains of a great industrial corporation wrought such sudden and vast changes as has the entry into the Pacific Northwest of the great Long-Bell Lumber Company of Kansas City, Missouri, eight years ago. And still rarer among the records of industrial expansions of this nature are the effects on shipping via water routes to all corners of the world that this organization brought about by establishing the huge Long-Bell mills on the banks of the Columbia River at its confluence with the Cowlitz on the Washington side.

Vessels loading lumber at the Longview Dock. Lumber from this dock goes to practically every country in the world.

Ten years ago all that was to be seen in the area now comprising the new city of Longview were low muddy flats and cow pastures with placid cattle munching the rich, water-soaked river grass. Across the Cowlitz River, the city of Kelso watched over the pastures with undisturbed calm—the whole making a complete picture of a typically agriculturally backed river town. In 1921 and 1922 came the news of huge new lumber mills to use that great block of timber lying east and north of the Columbia, in Cowlitz and Clarke counties. And with the news came city planning experts to lay out, complete, a $50,000,000 city that was to rise on the river bank where once a dairy held forth.

These were surprising developments, and many old-time lumbermen of the Columbia expressed doubts. But these changes came, and they came swiftly, creating a new industrial center of the Northwest, at which, within five years, the Weyerhauser interests had built a second mill, even greater than the Long-Bell plant, and around which pulp and paper mills have been dovetailed into the lumbering operations.

Now between three and four million feet of lumber per day are turned out in these twin giant sawmills, producing a cargo of around one billion feet per year for the holds of vessels from all parts of the world. In addition to this, naturally, we find a great quantity of general cargo movement in and out of the port and, as a consequence, a rising young port district commission providing public terminal facilities of the most modern kind.

Unlike practically all of the older ports of the country, Longview had to create its own terminals of the publicly operated variety without being in competition with privately-owned terminals from the start. Because of its strategic location halfway from the Columbia River en-

(Continued on Page 23, Blue Form)

An interesting construction view of the new Longview-St. Helens Columbia River Bridge soon to be completed by the Bethlehem Steel Company at a cost of $4,500,000.

Modern Ship Propulsion

Some Phases in the Design and Operation of Marine Machinery as Influenced by Modern Power Plant Engineering

By A. Kennedy, Jr., and R. A. Beekman,*
Federal and Marine Dept., General Electric Co.

MODERN power plant engineering in the past 25 years has shown marked improvements in the generation and distribution of power. Twenty-five years ago many of the good plants in the United States required 2.5 pounds of coal to generate one kilowatt hour. The thermal efficiency was approximately 12.5 per cent. Today there are several large plants generating a kilowatt hour on less than 1 pound of coal, which is equivalent to a thermal efficiency of approximately 25 per cent. Experimental plant tests have recently been made with improved conditions which indicate a further increase up to a thermal efficiency of something over 30 per cent.

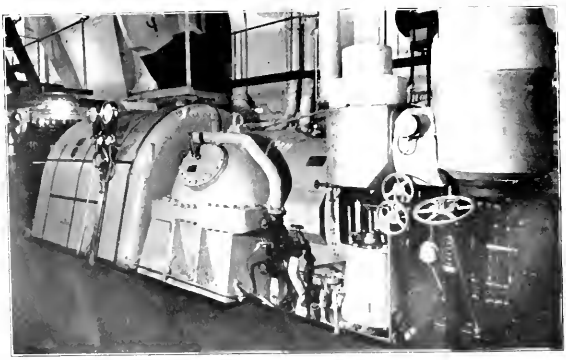
The improvements in the larger power stations have been accomplished by utilizing improved steam generation, more efficient units operating over an extended available energy range, recovery of heat by systems of feed water and air heating, decreasing stack gas temperature, and improvements in the auxiliary apparatus. The diesel engine has also played an important part in improving the thermal efficiency of power generating; and it is, therefore, proposed to discuss in this paper the possibilities of the future improvements of ships' propulsion plant along the two main lines of steam and the diesel engine.

*Abstract of paper presented at World Engineering Congress, Tokio, November 6, 1929

Steam

The Scotch marine boiler has proved itself throughout many years; but recently the advent of higher pressures and temperatures has led to the perfection of the marine water-tube boiler. However, a relatively small percentage of ships are so equipped, and hence this should be one item for future improvement of the world's shipping.

The majority of Scotch boilers certainly are working at not over 250 pounds gauge and 500 degrees Fahrenheit (260 degrees Centigrade) total temperature. With water-tube boilers there is in operation at this time at least one ship making use of 550 pounds gauge and 750 degrees Fahrenheit (398 degrees Centigrade) total temperature, and several others using from 250 to 340 pounds gauge and a total temperature from 600 degrees Fahrenheit (316 degrees Centigrade) to 700 degrees Fahrenheit (371 degrees Centigrade). The effect of these increases in pressures and temperatures on the plant economy will be considered later. It is mentioned at this point simply to indicate the trend in boiler design.



One of the General-Electric turbo-electric generators of the main propulsion power plant of the Panama Pacific liner Pennsylvania.

In combination with the boiler there have been developments and improvements in superheaters, feed water heating, air preheaters, economizers, burners, forced and induced draft arrangements, and condensing equipment which have resulted in marked economies in land plants. Some of these have been applied to various marine installations, but there has not been the concerted and combined effort to take advantage of these that there has been in large central stations. Therefore, these features seem to offer possiblities for the future in the marine field.

The foregoing amounts to saying that true economy lies in proper coordination of the parts of the entire plant based on modern practice and knowledge of heat conservation and balance. The average ship offers a most fertile field for improvements in this direction.

In the matter of fuel, at present, there appear to be four possible lines of advance in improved economy:

1. The use of instrumentalities for observing and setting conditions of combustion such as carbon dioxide content, stack temperatures, and firing.
2. An increase in the use of oil and possible further gains in burning it.
3. Replacement of hand firing of coal by stokers.
4. Use of pulverized coal.

Few ships are properly equipped to determine the factors listed in one. In central stations these have proved to be of major importance in achieving in operation what the design of the plant has contemplated. Starting with a determination that the fuel measure up to a specific heat content and following through the cycle maintaining the conditions of combustion and firing are items of operation which are of prime importance, and most ships certainly are not operated on this basis today.

The economical gains which can be made by using oil fuel in place of coal depend to a great extent upon the trade routes and other operat-

ing conditions of the vessel and hence broad statements cannot be made, but the situation surrounding each ship must be investigated.

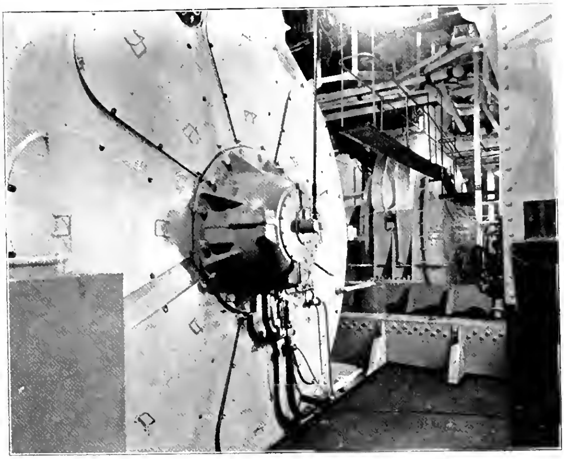
Early installations of stokers did not prove to be suitable for marine service and hence this acted to somewhat retard their further adoption. However, in some recent installations this experience has been reversed. Quoting from Mr. J. Johnson, superintending engineer, Canadian Pacific Steamships, Ltd., London—"On trial, boiler efficiencies of 82 and 75 per cent. were obtained with the stoker and hand firing respectively. . . . . It will be observed from a study of the foregoing table that when the consumptions are corrected to a uniform basis of 13,500 B.t.u.'s the mechanically fired installations show a higher average efficiency of 9 per cent. The difference has been as low as 5 per cent. and as high as 10 per cent. on individual voyages. The vessels with the mechanical stokers have registered about $\frac{1}{4}$ to $\frac{1}{2}$ knot higher average speed." In a ship operating on the Great Lakes in the United States, similar results were obtained with stokers giving a boiler efficiency of approximately 83 per cent. and resulting in a reduction in the fire room force of six men, which represents a reduction of 68 per cent. of the force required for hand firing.

Some very large installations have been made on land using pulverized coal; and the general attitude of the central station industry in the United States is a sympathetic one. However, it is considered inadvisable to make broad claims at the present time.

Only a few installations have been made on ships, and these may be called experimental. Especially is this true of the steamship Mercer in view of the fact that Scotch boilers were adapted to this type of fuel with provision for also burning oil. This, therefore, may offer quite a field for future improvements in certain classes of vessels.

A considerable showing has been made on a moderate number of steamships by the use of electric auxiliaries. With diesel engine propulsion the use of electric auxiliaries received a great impetus and confidence was established in them so that there should be no hesitation on the part of the marine fraternity in accepting their use.

As an indication of what may be accomplished along this line, we quote from a paper "A Central Power Station Goes To Sea," by Commander Q. B. Newman, U.S. C.G. In the paper he compares two turbine electric driven Coast Guard cutters, the Modoc and the Pontchartrain. In the former all the usual auxiliaries with the exception of the steering gear are steam driven, while in the latter the only steam auxiliaries ordinarily used at sea are the boiler feed pumps; in the latter the steam conditions also have been somewhat improved. Therefore, these vessels offer an excellent comparison on this item of electric auxiliaries. Captain Newman states that on the Modoc approximately 32 per cent. of all steam produced went to auxiliaries, under the full power condition. In the case of the Pontchartrain the corresponding figure is approximately 14 per cent. On the Great Lakes cargo ship referred to previously the steering gear and a small amount of stoker machinery are the only steam auxiliaries. On this vessel the steam required for all other auxiliaries, which are taken from the main electric propulsion unit, is less than 10 per cent. of the total steam used.



The two propulsion motors of the Panama Pacific liner Pennsylvania. Each of these motors is rated 8500 horsepower at 120 revolutions a minute.

As stated, in both the cases cited the auxiliary power is taken from the main turbine and for the most part directly from the main propulsion generator by the use of alternating current motors. However, where direct-current auxiliaries are considered essential this result, with a slight reduction in the saving, may be accomplished by the use of a motor generator set.

A study of the steamship Virginia where the electric auxiliaries are taken from separate turbine generator sets having a water rate of 14.6 pounds per kilowatt hour under actual sea conditions shows that a saving of approximately 2 per cent. would be had if the auxiliaries were taken from the main unit through a motor generator set. This ship, due to electric cooking, heating, and cargo refrigeration, has a rather unusually large auxiliary load and, therefore, the saving made by using the motor generator is less than would be the case were smaller and hence less efficient auxiliary turbines used in the ordinary way.

A scheme for improving economy and speed of existing reciprocating engine driven ships has been introduced in Germany. This is known as the Bauer-Wach system. It consists of a turbine using exhaust steam from the engine and connected to the propeller through reduction gearing. A modification of this system is building in England using electric transmission between turbine and propeller. In the latter case the expected saving in fuel at the same speed of the ship is between 20 and 25 per cent.

(To Be Continued)

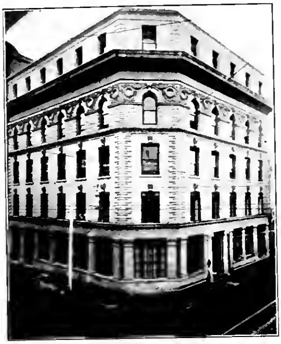
"The Biggest Little Ships"

Waialeale and Hualalai Make Excellent Impression on Inter-Island Steam Navigation Company and Traveling Public

By Andrew Farrell

THE Inter-Island Steam Navigation Company of Honolulu believes and proclaims that it offers the best cross-channel shipping service in the world. For many years the company and its predecessors have maintained sailings from Honolulu, the capital and metropolis of Hawaii, to the outlying islands of the archipelago, at first with slow wooden steamers, next with iron and steel vessels, each new craft representing an advance in size, speed, and comfort. In 1923 a new and bold policy was adopted: the steamship Haleakala, built by the Sun Shipbuilding Company, a vessel of a size and a cost hardly imagined a few years before, was placed in the Honolulu-Maui-Hilo service; and she has been followed by various other steamers, notably the Waialeale and Hualalai, the latter of which was delivered in June, 1929. With her the modernization of the fleet was completed; every part of Hawaii now enjoys a communication with Honolulu that would have been considered chimerical ten or fifteen years ago; and the fleet as a whole has attained an excellence that justifies the pride of the company.

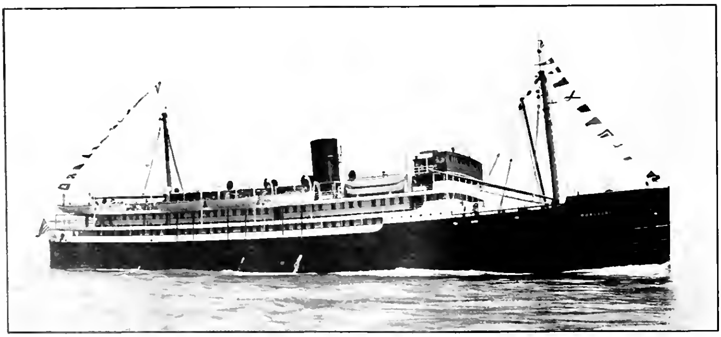
Especially have the Waialeale and Hualalai made the most favorable impressions on the Inter-Island and on the traveling public. They are those very rare things, true sister ships, built from the same plans, identical in all respects except for the entrance to the cabin of the chief engineer. The most discerning observer might be challenged to distinguish between rooms of the same number on the two vessels. Both were built by the Bethlehem Shipbuilding Corporation, San Francisco plant, which has also done other work recently for the Inter-Island. The Waialeale arrived at Honolulu on June 11, 1928, and the Hualalai on June 11, 1929—the dates are significant, since June 11 is Kamehameha Day, the old Hawaiian national holiday, the Hawaiian Fourth of July; and both are giving excellent service, the Waialeale to the island of Kauai and the Hualalai to Molokai and Maui. To complete the parallel between the two vessels it is necessary only to add that the Waialeale is named for the dominant mountain peak of Kauai, which on one side is a virtually perpendicular massif 5200 feet high, whose summit has had a rainfall of about 600 inches in a single year; and the Hualalai is named for a dormant volcano on the island of Hawaii, 8200 feet in height, which in September, 1929, was showing ominous signs of an impending eruption after more than a century of quiescence. All the company's principal vessels are named for Hawaiian mountains, and most of them, as is natural in an igneous country, for volcanoes—the Haleakala, among others, for a huge dormant dome on Maui.



The home office of the Inter-Island Steam Navigation Company at Honolulu.

Arthur H. Armitage, general manager of the Inter-Island, was asked concerning the performance of the Waialeale, the older of the two sisters and consequently the one on which more data are to be had.

"We are perfectly satisfied," said he. "The ship pleases us in every respect. She handles excellently and steers easily." Her Westinghouse geared turbines have functioned well at Ahukini, her principal port of call at Kauai, a cramped and dangerous harbor, where much maneuvering is necessary and steam must be maintained at all times for a possible hurried exit. "Her engines have had to perform



The Inter-Island passenger liner Hualalai.

well there," said Mr. Armitage. "So far as we can see, they are fully the equals of reciprocating engines in maneuvering. Not only are we pleased with the Waialeale, but travelers are likewise. You should hear the compliments we receive."

The Waialeale is a vessel of 3092 gross tons, of 1765 net; she is 310 feet and 10 inches in length, 48 feet in breadth; has accommodations for 212 cabin passengers and 96 steerage, and space for 1170 tons of cargo. She was designed by C. McRitchie, naval architect of the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., who has met the needs of a tropical steamship service in a manner that many another naval architect might well emulate. Although Hawaii has never known the excessive heat under which much of the mainland swelters in the summer, a tropical sun, beating upon a steel hull for twelve hours a day, can convert a poorly designed vessel into a furnace. Happily the Waialeale is cool; her rooms are large and airy; all have two wide Simmons beds, besides a Pullman upper berth, which itself is far more comfortable than were the best berths on the steamers of twenty years ago. Her relatively wide beam contributes to make her a steady vessel in the Oahu-Kauai channel, a rough place much of the time. This and the excellence of her accommodations have enabled the Inter-Island to nicrease passenger business to and from Kauai greatly, principally travel of tourists, who are not disposed to embark on uncomfortable vessels for the sake of visiting the outlying islands. But the greatest appreciation of the Waialeale comes from those residents of Hawaii who must voyage between the islands on business.

In selecting turbines for the Waialeale the Inter-Island departed from its old practice of using reciprocating engines. Not only is the Waialeale the first turbine-driven steamer of the company, but she is the first twin-screw, even the larger Haleakala having a single wheel; and the Waialeale was the second vessel to use water-tube boilers in preference to fire-tube, the Haleakala being the first. The Waialeale has four Babcock and Wilcox oil-burning boilers,with steam pressure of 280 pounds, but she seldom needs all four boilers, and generally has steam in only two. Her fuel oil consumption, for the period from June, 1928, to October, 1929, has averaged only 6.7 barrels an hour at sea. This is, of course, small in view of the fact that each of her Westinghouse double-reduction steam turbines is capable of generating 4000 horsepower. On the other hand the vessel is not driven hard. Her guaranteed speed was 15 knots; she made 16.2 on her trial, and has never been called upon for so much since, because her schedule does not require that she exert herself. She regularly makes two round voyages a week between Honolulu and Ahukini, as well as other ports of Kauai; from Honolulu to Ahukini is ninety-seven nautical miles, and she has about nine and one-half hours for the voyage, or from 8 o'clock in the evening to 5:30 o'clock in the morning. In view of all circumstances the company finds that 8 o'clock is the most satisfactory hour of departure from Honolulu, and there is no reason for arriving at Ahukini before daybreak—in fact the company will not permit its vessels to enter and leave Ahukini by night. For that reason sailings from Ahukini are at 6 o'clock in the evening, and the inbound voyage is more than two hours longer than the outbound. The outbound voyage has averaged nine hours and ten minutes, and the inbound eleven hours and fifty minutes. When the new and safe port of Nawiliwili has been completed, the Waialeale probably will depart from Kauai at 8 o'clock in the evening.

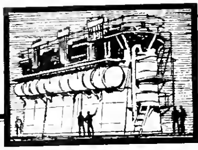
During both voyages she feels the easterly trade winds—easterly for the last few years, instead of northeasterly, this because of a southward shift of the Aleutian high area. Outward the trades take her on the starboard quarter, inward on the port bow. Her average speed to Ahukini has been 10.5 knots, her inward speed to Honolulu 8.2, both far less than her maximum. On the outward passages she has averaged 85 revolutions of her wheels a minute, on the inward 76, as compared with her maximum of 135; her slip on the outward passage has been 13.3, on the inward 18, the increase being due to the head trade wind and head sea, both of which can be rather strong and for the most part are steady.

In maintenance and repairs the Waialeale has been extremely satisfactory. For the usual renewal of gaskets and packing, resurfacing of valve faces, and the other engine routine of any ship, besides repairs to the oil cooler, the cost was only $1300 for the six and one-half months from June, 1928, to December 31, 1928, the latest period for which totals have been assembled. Up to the middle of October, 1929, the sole repairs were to the oil cooler, already mentioned, which developed a split tube, and to the condensate pump, the shaft of which got out of alignment. To the main engines there had been no repairs whatever up to the middle of October, 1929. The split tube of the oil cooler cost 400 gallons of lubricating oil, which became emulsified and was dumped; except for that mishap, the consumption of lubricating oil for the turbines would have been negligible, as the oil is, of course, centrifuged and used over and over. For auxiliaries the consumption of lubricating oil is about a gallon to each voyage.

Although the Waialeale is primarily a passenger vessel, and the Inter-Island now handles little sugar, this because the Matson Navigation Company, an affiliated corporation, loads virtually all the island raws for direct shipment to San Francisco, the vessel does carry considerable miscellaneous freight. As a cargo-carrier she has given abundant satisfaction, both because of the excellence of her design and the functioning of her Allan Cunningham winches.

One noteworthy aspect of the Waialeale and the Hualalai is their impressiveness. Seen from a distance, especially at sea, where there is no standard of comparison, both could easily be mistaken for ocean-going liners. For that matter both have been so mistaken when seen across Honolulu harbor, which is not the largest expanse of water in the world. They merit the appellation bestowed on them "the biggest little ships ever built."

Taken all in all, the Waialeale is a credit to her designers and builders and the corporations that supplied equipment; there is no reason to doubt that the Hualalai will prove equally as satisfactory when she also has been in service sixteen months.



In the Engine Room

Improving Efficiency With the Surface Condenser

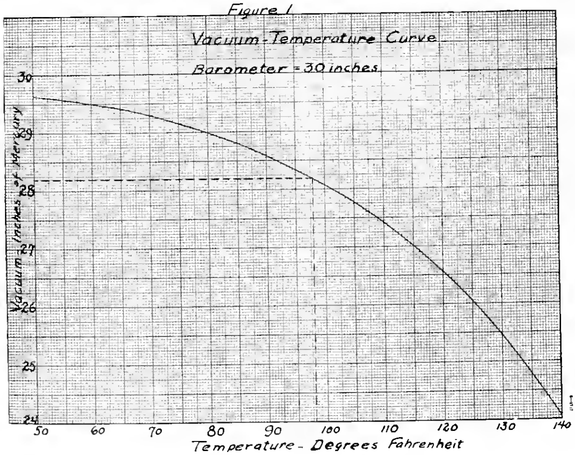
Some Considerations Directing the Attention of Marine Engineers to the Symptons of Condenser Trouble and the Most Effective Methods for Improving Condenser Performance

By Lieutenant C. A. Griffiths, U. S. Navy

MARINE engineering efficiency's silent guardians, the main condensers, because of their very silence become a habit to be accepted without consideration of the various ills from which they may be suffering. A groaning pump draws the attention of the officer of the watch; a hot drop on the shoulder discloses a leaky valve stem or flange; visible steam leaks from stuffing-boxes are quickly noticed; and clouds of black smoke from the stack, particularly with a following wind, calls forth the wrath of the officer of the deck on all things visible and invisible in the domain of the black gang. But a leaky condenser tube will not shout its failure, nor do cries of anguish resound from within the condenser shell when air leaks develop. Those troubles are indicated in other ways, less apparent.

The high efficiencies obtained by motor ships can be competed against only by the strenuous efforts of the chief engineer of the steam vessel who must continually strive to get the very best results out of the equipment he has at hand. With the growing popularity of diesel engines, competition becomes more and more keen; and in a comparison of operating costs only the most efficient of the steam ships show a profit approaching that of the motor ship. Thus, to belong to the profit making group, careful attention to every detail in the operation of the steam plant is essential. The engineering efficiency of the turbine ship is more affected by the influence of the vacuum in the condensers than is that of the reciprocating engined vessel. Reduced consumption and operating costs of both, however, are affected, yet improvement in the performance of the main condensers is not too often considered.

Absolute pressure is measured from zero pressure of the atmosphere, zero pressure absolute being 14.7 pounds per square inch below atmospheric pressure when the barometer stands at 30 inches (mercury). It has, therefore, become common practice to assume that one pound pressure equals two inches of mercury. When the pressure within the condenser is greater than zero absolute, as must always be the case, the sum of the absolute pressure and the vacuum within the condenser will equal the barometer reading. For every vacuum there is a corresponding steam temperature, the relationship based on a 30-inch barometer being shown in Figure 1. This curve shows that vacuum actually in the condenser based on the temperature of the exhaust steam within it. Vacuum gauges are frequently difficult to keep in accurate calibration, as air leaks in the lines, valves, and fittings will cause untrue readings. They are recommended for use only as a means for a quick check on the condenser vacuum in their accessible location on the gauge board. The most accurate method of learning the true conditions within a condenser is by the installation and use of thermometers installed in the condenser shell in the path of the exhaust steam. Tables of the vacuum corresponding to the temperature, prepared from the curve, Figure 1, can be made and secured in a convenient location to the thermometer; so that, when the temperature is read from the



thermometer at, say 85 degrees, the corresponding vacuum can immediately be read from the scale to be 28.8 inches.

It is standard practice to design marine reciprocating main engines to operate at full power on a vacuum of about 25 inches, while marine turbines are designed for about 28 inches. A vacuum greater than that specified in actual service will probably result in a decrease in the overall plant efficiency rather than an increase for the reason that the power required to drive the circulators and air pumps will more than overcome the net increase in the main engine economy due to the higher vacuum obtained. Any decrease in the vacuum, however, is immediately felt in the economy of the plant. The curve, Figure 2, shows the effect on the total steam consumption of the engines operating on reduced vacuum. From this curve it is observed that in the case of a turbine designed to operate on a vacuum of 28.5 inches, a reduction in the overall efficiency due to an increased steam consumption of 20 per cent will exist when the vacuum drops to 25 inches. It is to prevent this decrease in the economy of the plant that is one of the chief engineer's most important tasks.

Those causes of low vacuum, such as the design of the condenser, the temperature of the sea water, and the barometric pressure, are beyond the control of the chief engineer. There are other causes for a low vacuum, however, that can be controlled from within the engine room, and of them the following are the most common and most disastrous if not corrected.

(1) Air Leaks Into the Vacuum System

Air entering the system through leaky flanges, stuffing boxes, joints, and with the steam is the most common cause of low vacuum for it takes up space in the condenser, collects on the tubes and insulates them, and overloads the air pump in being removed. The temperature of the air pump suction is an indication of the quantity of air present in the condenser. With little or no air present the air pump suction would be the same as the vacuum temperature. As this condition is never realized in actual practice, these temperatures cannot be equal, but they can be approached. The air pump suction temperature in a marine condenser practically free of air leaks should be within five degrees of the temperature of the vacuum. Hence, for a given vacuum, the greater the proportion of air present, the lower must be the air pump suction temperature, and the difference between that temperature and the vacuum temperature will be correspondingly greater.

The most easily made test for air leaks is the candle test. With the system under a vacuum, go over all joints and fittings offering any possibility for the admission of air. Leaks of any size at all will show up by a flickering or sucking in of the candle flame. Numerous minute leaks will have equally as bad an effect as a few large leaks, and they cannot be discovered by the candle test. To locate these small leaks, put the system under an air pressure of about five pounds and coat the exposed joints, flanges, bolt heads, etc, with soap suds. Leaks will show up in the formation of bubbles. After locating the leaks in the system, they can be remedied by painting the flanges and similar fixed joints with shellac or asphaltum paint, while leaks around stuffing-boxes and moving rods can be stopped by the use of grease. Testing for air leaks should be part of the established routine, both before getting underway and during periodic overhauls.

(2) Displaced Baffles

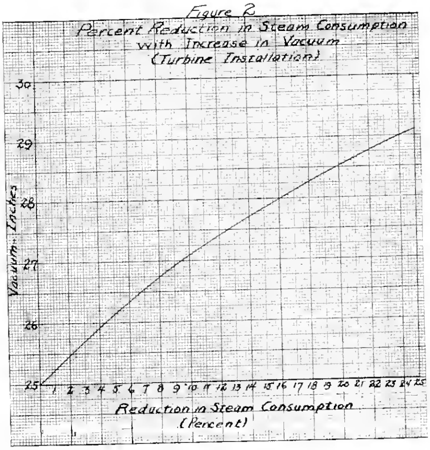
Baffles on the steam side of the condenser that have been carried away or broken will result in uneven work being done by the tubes in that certain tubes will transfer more heat than will others instead of distributing the exhaust steam evenly over the whole nest of tubes. This will result in the rapid deterioration of certain tubes due to the erosive action of the wet steam if allowed to persist. Replacing the defective baffles is the obvious means to correct the trouble and can be easily accomplished by a comparison of the actual conditions with the blue prints of the condenser.

Displaced or broken deflecting baffles in the main injection will result in some of the tubes receiving a greater percentage of the circulating water than others, and should be corrected immediately after discovered. Displaced baffles in the injection can he discovered in certain types of condensers by a definite line of hot and cold on the discharge head; that is, the section of tubes not receiving sufficient water will be hot while the rest will be cool. The effect of insufficient cooling water on account of defective baffles will be an increase in the vacuum temperature.

(3) Insufficient Circulating Water

The overboard discharge should leave the condenser at from 15 to 20 degrees higher temperature than the injection. The injection temperature should be about 5 degrees below the temperature of the vacuum. Thus it is seen that a limitation is placed on the possible vacuum obtainable by the temperature of the sea water. If, for example, a ship in southern waters has an injection temperature of 70 degrees the overboard discharge temperature will be about 90 degrees and the corresponding temperature of the vacuum in the condenser will be about 98 degrees. The vacuum at this temperature, from Figure 1, will be 28.2 inches, which will be the maximum vacuum that it is possible for the condenser to obtain.

The quantity of circulating water required depends on several factors; namely, the power being developed by the engines, the temperature of the sea water, and the condition and cleanliness of the tubes. The condenser must be full of circulating water at all times, and



when it is known that it is not full the trouble may be due to one or any combination of the following causes:

Water side air bound. This may be corrected by relieving the air which has collected in the upper part of the condenser by installing a pet cock at the highest part. Keeping the pet cock cracked will permit a small stream of circulating water to flow out after all the air has been released.

Plugged injection. Insufficient circulating water may be due to the injection valve not being completely opened or, if open wide, it may be loose or broken on the stem. It may also be due to plugging by foreign matter, such as kelp, a log, or clothing thrown overboard. A steam blow down line in the main injection will frequently clear obstructing foreign matter. A decided drop in the vacuum and a corresponding rise in the condenser temperature will be noticed if there is sufficient foreign matter present to plug a large number of tubes.

Main circulating engine speed too low. This can be readily learned and corrected by speeding up the pump.

(4) Dirty Condenser Tubes

The rate of heat transfer from the steam to the tubes to the circulating water depends directly upon the cleanliness of the tubes. When a coating of dirt lies on the tubes it acts as a heat insulator and restricts the passage of heat. On the steam side of the tubes dirt in the form of grease, scale, or rust may be carried into the tube nest by the steam and deposited on the tubes. A periodic inspection should be made of the steam side, and if accumulations are in evidence the condenser should be boiled out. A satisfactory boiling out solution consists of 200 gallons of fresh water, 50 pounds of soda, and five gallons of kerosene for every 1000 gallons of water that the condenser will hold. Fill the condenser with fresh water to which this mixture has been added in the proper proportions, connect up a steam hose to the bottom, and boil out for twelve hours. Upon completion of the boiling out period, empty the condenser into the bilges and thoroughly clean out with several washings of fresh water. Care must be taken to ensure none of the boiling out mixture or dirty water from the condenser entered the feed water system.

The water sides of the condenser tubes become fouled with shells, kelp, barnacles, grass, and, particularly when the ship has been operating in shallow water, mud and sand. These accumulations can be seen through the tube ends when the condenser is opened up for repairs or inspection. In the case of extensive deposits of dirt on the water sides, the passage of circulating water through the tubes is so restricted that there will be a noticeable drop in the vacuum. Dirty tubes are most readily cleaned by an air or water lance made from a piece of small tubing and pushed through the tubes. The jet of air or water washes out the obstructions after they have been loosened by the lance.

Improper Operation of Pumps

The speed of the main circulating pump should be just enough to deliver sufficient water to condense the exhaust steam. An approximation of the correct speed of the pump may be had by observing the temperature of the overboard discharge, which should be from 15 to 20 degrees higher than the injection. Variations in this temperature, with clean tubes and no obstructions, can be made by varying the speed of the circulating pump. More circulating water than that actually required is not only uneconomical in pump work but it reduces the temperature of the condensate as well to a temperature below that which is necessary for an economical heat balance; namely, 5 to 8 degrees. Any reduction in this temperature requires a corresponding amount of heat in the hot well to again heat the condensate for feed water.

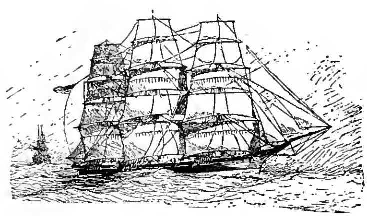
The speed of the air pump is dependent upon the condition of the pump valves, the speed of the ship, and the vacuum being maintained. Air pumps generally are of large power and have correspondingly high steam consumption, and they should be run, therefore, as slowly as possible consistent with maintaining balanced conditions. Once these conditions have been obtained a greater air pump speed will not increase the vacuum in proportion to the amount of steam expended, and the net results in the plant efficiency will be a loss intead of a gain.

A well balanced vacuum system as a dominating factor in the overall efficiency of the engineering plant of a ship cannot be overemphasized, and the balanced conditions cannot be obtained unless the temperatures are accurately known for all parts of the system. There should be four thermometers installed; namely, (a) in the exhaust trunk directly in the path of the steam, (b) in the main injection, (c) in the overboard discharge, and (d) in the air pump suction line. Maintaining a balanced temperature condition in the system as outlined above will result in a better vacuum, reduced pump work, increased overall efficiency, and reduced fuel consumption. When it is realized that approximately 50 per cent. of the total heat of the fuel used in the boilers is eventually lost through the condensers, the opportunities for improving their operation should never be neglected.

Illustrating the actual saving in dollars and cents from increasing the vacuum in a turbine installation of about 2000 shaft-horsepower, we see from Figure 2 that increasing the vacuum from 25 to 28 inches effects a reduction in the steam consumption of 16 per cent. This engine will use approximately 18.5 pounds of steam per shaft-horsepower hour with the lower vacuum. At 28 inches vacuum this steam consumption is reduced to 15.54 pounds per hour, a reduction of 2.96 pounds of steam per hour. In a day of 24 hours this amounts to:

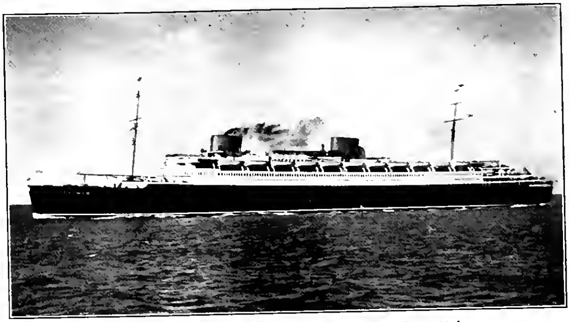
$$2.96 \times 2000 \times 24 = 142{,}080 \text{ pounds.}$$

In an oil fired boiler at a rate of 1/13, this saved steam will be the equivalent of $142{,}080 \div 13 = 10{,}931$ pounds of fuel oil, or 29.5 barrels. At $1 per barrel the saving in only one day's steaming would amount to $29.50.



The Bremen Design

By R. C. W. Courtney



The North German Lloyd Atlantic flyer Bremen making 29 knots. Note the remarkably small bow wave.

THE new North German Lloyd liners Bremen and Europa are unquestionably the most outstanding merchant ships that have appeared since the advent of the Lusitania and Mauretania nearly a quarter of a century ago; and although a great deal of secrecy has been maintained regarding constructional details, several interesting and important features are at once apparent on examining the general design.

In order, however, to properly appreciate the conditions under which the Bremen has been produced, it is necessary first of all to consider the amount of data regarding large high speed vessels both for naval and mercantile purposes available in 1926, when the order was placed, to the conditions existing in 1904-1905 when the Mauretania was designed. At that time the largest liners afloat did not exceed 24,000 tons gross, and the blue ribbon of the Atlantic was held by the Kaiser Wilhelm type of express liner with a speed of just over 23 knots. Contemporary warship practice did not offer much assistance, as the fastest cruisers afloat, the 14.000 tonners of the British Drake class, were only able to average about 23½ knots with short bursts of 25; in fact, mainly owing to the limitations imposed by machinery weights, matters had not really progressed very far from the famous United States cruiser Wampanaog and her sisters of 1865.

The introduction of the marine steam turbine revolutionized warship design and also enabled the record breaking Cunarders to be built. Whilst they were under construction a start had been made with the development of the large high speed armored cruiser which began with Admiral Fisher's Inflexibles of 26 knots and culminated in the Hood of 40,000 tons and 150,000 shaft horsepower for 32 knots and the American Saratogas of 180,000 shaft horsepower and 33 knots. The German navy had also developed this class of warship to its fullest extent, and at the Armistice work had been commenced on some large cruisers of very high speed.

All the data concerning these vessels have obviously been considered in the Bremen as the influence of warship design is clearly seen in practically every line of the underwater part of the hull. The question of reducing skin friction has received very careful attention, as, apart from the adoption of the Taylor bulbous bow, the shell plating is overlapped with the edges at the forward end, the object being to produce eddies which, according to a well known theory, assist propulsion; and a gain of ½ knot is claimed by this arrangement. The adoption of a streamline rudder in combination with the extreme simplicity of the after body should help matters considerably, and it is interesting to note that the British pilot responsible for docking the Bremen at Southampton has publicly drawn attention to the exceptional handling qualities of the vessel.

The influence of warship practice is also to be noticed in the arrangement of the machinery as instead of the 48 boilers of the Majestic, representing the best German prewar practice, 20 high capacity, small tube, water-tube boilers are installed having a working pressure of about 370 pounds per square inch with superheaters to give 700 degrees steam temperature and a total heating surface of 240,000 square feet as against 220,00 square feet in the Majestic.

Each propelling unit consists of high, intermediate, and low pressure turbines running at 1,800 revolutions per minute and driving the four propeller shafts at 180 revolutions per minute through single reduction gearing; the total power developed being about 110,000 shaft horsepower. Six large diesel-driven dynamo sets are installed, four in the auxiliary engine room and two on the boat deck to take over the lighting system in case of emergency. The consumption of fuel oil is stated to be 0.68 pound per shaft horsepower per hour for all purposes, which com-

(Continued on Page 509)

	NEW YORK	DEUTSCHLAND	MAURETANIA	BREMEN
Length B.P.	528 feet	662.75 ft.	760 feet	888 feet
Breadth	63 feet	67 feet	88 feet	101.7 feet
Draft	23 feet	29 feet	31.5 feet	32 feet
Displacement	13,000 tons	23,500 tons	35,000 tons	50,000 tons
Engines	Twin Screw Triples	Twin screw, 6 cyl. Quadruples	4 screw direct drive turbines	4 screw single reduction turbines
Boilers	Scotch	Scotch	Scotch	Watertube
Working Pressure	150 lbs.	220 lbs.	195 lbs.	370 lbs.
Shaft H.P.	16,000	32,500	75,000	110,000
Heating Surface	50,265 sq. ft.	85,468 sq. ft.	158,350 sq. ft.	240,000 sq. ft.
Speed in Knots	20	23.02	27.	27.9
Number of Funnels	3	4	4	2

FAMOUS ATLANTIC LINERS COMPARED

United States	American Line	New York
German	Hamburg-Amerika	Deutschland
British	Cunard	Mauretania
German	North German Lloyd	Bremen

(New York was originally built on the Clyde but rebuilt in United States.)

Better Engine Room Efficiency Through Quality Lubrication

By A. L. Harrison

THE rapid progress that is being made in commerce by the airplane has brought to light new problems in ordinary shipping circles. It must be clearly evident even to a novice, however, that the shipping of large quantities of any merchandise via airplane is very far distant, if ever a possibility. Notwithstanding, that form of conveyance has brought forth a desire for faster transportation in every form of vehicle used to supply us with our daily needs.

To meet the newly imposed situation, engineers have contributed information and developments that represent years of exhaustive research. Both boiler and engine efficiencies have been largely increased without sacrificing simplicity, compactness, durability, or safety in any established make of boiler or engine. The new arrangements are not beyond efficient operation by properly trained engineers. In other words, the work of our designers and builders has advanced along the lines of correctly established engineering practice.

Solving Fuel Problems

In spite of the splendid showing of our designers and builders, the desire for faster travel has increased operating cost. A move to reduce this burden on transportation companies was planned in the marine field shortly after the late war by the United States Shipping Board. To make this plan practical, the Board obtained permission from the Bureau of Steam Engineering to start a school at the Philadelphia Navy Yard to teach engineers the finer points of fuel oil combustion. The instant popularity of this school led to the opening of another at Mare Island. Many engineers were unable to attend these schools, but the men who did attend were from widely scattered localities, and they received much helpful information from the lectures and experiments that were given in these courses. Due to the wide range of shipping companies represented, the knowledge gained at the two schools soon became generally spread and was put into practice on many vessels. The result of the Shipping Board's splendid plan has saved thousands of dollars in fuel consumption and general boiler maintenance.

Solving Lubricating Problems

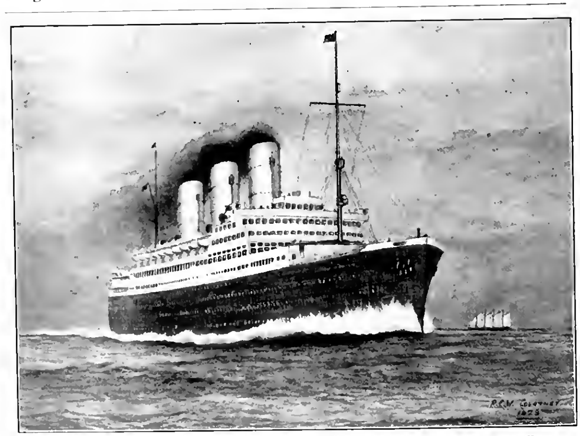
Chemistry—simplified to a degree that all could understand, without the scientific training usually required—was the factor largely responsible for the success of the fuel oil schools. No attempt will be made here to explain the methods used by the instructors to simplify this subject. The point is to stress the bearing it had in solving the problems pertaining to fireroom efficiency, and to emphasize some of the ways in which the same type of training in chemistry may assist in solving the problem of increasing efficiency abaft the fireroom bulkhead in the main propulsion plant and its auxiliaries.

The operation of high speed turbines, heavy reciprocating engines, and the newer type diesel units demands intensive study. Some of the difficulties that arise should be discussed at length to avoid their repetition. On present basis voyage repairs consume too much of a ship's earnings.

Demands for promptness of dispatch are pressing. Delays in port are costly. They become almost disastrous with perishable goods as freight in the busy season. Even repairs that require no delay often wipe out the profits of a whole voyage.

In the face of foreign competition, American ship owners must achieve the continuous operation of their vessels with a less maintenance and repair charge. That will hardly be possible unless something is done to correct certain existing conditions. Many of these conditions involve problems of lubrication. A course in this subject like the one given in fuel oil economy would appear to be justified. But, in view of the satisfactory progress made in the subject by the leading oil companies of the countries, a great deal has been accomplished. The information, however, while possible to obtain, is not always readily accessible, nor is its importance always realized.

With some of the data made available by the oil companies, we will try to show how excessive costs of engine room operation may be reduced. An investigation into all the angles of lubrication will show that the very best oils obtainable are often the least expensive. The quality of every oil should be ascertained to see if it will fulfill the conditions required of it. Less expensive oils are often bought on the



The Canadian-Pacific North Atlantic passenger liner Empress of Britain as she will appear when completed. This vessel, with a gross tonnage of 45,000, is to be powered with triple expansion, single reduction gear turbines to drive her at a sea speed of not less than 26½ knots. She will cost over $15,000,000.

pretext that they give just as good satisfaction as the more expensive grades. In many cases, this idea is too prevalent among purchasing agents—over the protests of the operators and the port engineers. Consequently, operating expenses are excessive.

The buyer, who quite often is not the user of an oil, should investigate the reasons for an increase of a few cents per gallon in the cost of a lubricant. In many cases, he will find that the price is justified. Ship owners should zealously encourage this practice.

The Chemist and the Marine Engineer

The chemist breaks down a compound into its elements to find out if that substance will fulfill the requirements expected of it. In this manner, the chemist helps the engineer to decide whether the product to be used contains any injurious substances. Again, a special product is necessary to meet an unusual condition. The chemist experiments with compounds until the desired constituents are obtained that meet that condition. He is working in harmony with the engineer in an effort to help solve his problems.

The engineer should go about his work in a like manner. He, too, can be of great assistance through trial and effort. As a result of his practical experience and training, he may find it advisable to suggest changes. Theory and practice thus combine to determine the selection of a lubricant.

Every reliable oil company employs expert chemists and specialists who are continuously experimenting to develop lubricants that will meet the most severe operating conditions. Engineers, purchasing agents, and ship owners should have no hesitancy in consulting these experts on lubrication problems. These chemists and specialists seldom fail to give service.

Lubricants at a Glance

A short discussion of lubricants will bring out the important qualities good oil should possess:

Friction. This term is used to define the resistance which reacts against movement when one body is in contact with another. The more nearly perfect rubbing surfaces are made, the less detrimental friction will be developed. The purpose of a lubricant is to keep bearing surfaces apart and to introduce a protective film between them. In selecting an oil to accomplish this purpose, the pressure on the bearings to be lubricated should be carefully checked. There have been cases where a good light-bodied oil has failed because of its inability to withstand heavy pressures, and it was pressed out of the bearing. A heavier oil is needed if a condition like that exists. The representative of the oil company can give reliable data on this topic through repeated laboratory experiments of its chemists. In addition to this source of information, he often has practical knowledge at hand of similar problems covered in the past. A check-up of the advice obtained (if put into practice) can be made after a few voyages.

Flashpoint. This characteristic of an oil really has nothing to do with its lubricating qualities. When oil is put into a bearing, however, its flashpoint should show the test of a good lubricant; that is, the flashpoint must be above any operating temperature by a safe margin. The same reasoning should be employed concerning the firepoint requirement as a safety precaution.

Base of an Oil. Much has been said about paraffin base and asphalt base oils. The best way to secure data concerning the most economical use of these respective oils in an engine room is from manufacturers of the oils. A reliable manufacturer will guarantee his lubricants to meet any special condition. In passing, it can be said that oils of both bases will meet any condition found in ordinary practice.

Viscosity. Every engineer should understand that this term means the resistance to internal movement of a liquid. In other words, it is the internal friction of the oil; the resistance of its molecules to rate of flow, so to speak. One of the important points to be checked when quoting viscosity is the temperature of the lubricant at each reading; the colder the oil, the more viscous or thick it becomes. Should it become necessary to buy oil in foreign countries, it is well to check against the viscosimeter that has determined the reading. This procedure is important in view of the many different type viscosimeters used outside of the United States. In spite of the loose application of the term, viscosity has become a determining factor in qualifying the merits of lubricants.

Other Factors. The selection of a lubricant should not be made until the conditions under which the oil is to be used are known. A safe and certainly sane thing to do would be to investigate the tests made for sediment, emulsification, coldpoint, and carbon, in addition to the viscosity and flash point. All engineers should be instructed how to proceed along these lines. The manner in which oil is to be used regulates and even prescribes its constituents.

Quality oils, beyond any doubt, should reduce the total cost of lubrication. Bear in mind that the total cost in the end may involve much more than the added expense of a good oil in cents per gallon. Voyage repairs show this to be clearly evident from a well known deduction. A perfectly lubricated bearing of proper design should disclose no wear.

The Design of the Bremen

(Continued from Page 507)

pares favorably with the latest high pressure turbine practice.

Apart from innovations of a purely technical nature, the designers have, in preparing the general arrangement plan, departed from the orthodox to a considerable extent so that the appearance greatly differs from recognized Atlantic liner practice and is therefore sure to attract attention if only from its novelty. It should be noted, however, that several of these unusual features are to be found in other vessels, the raked stem, for example, with rounded plating at the top has been embodied in all new Blue Funnel liners for several years; and an illuminated name sign was installed between the funnels of the large Dutch liner Gelria as far back as 1913. The curved front to the bridge and superstructure is to be found in the Mauretania and was also a feature of many Atlantic fliers of bygone days. The streamline funnels, each of which measures 49 feet 2 inches by 20 feet 4 inches, are a distinct innovation but apparently are too short.

There is little doubt that the existing speeds of 27.9 and 27.83 knots for the east and west Atlantic crossings will be improved on when the Europa enters the service next year and that a new era in the development of the large high-speed liner has begun. High pressure steam machinery is apparently still in its early stages of development.

Book Reviews

Our Sea Saga. Compiled, edited, and published by E. O. Sawyer, Jr., San Francisco. 232 pages, $6\frac{1}{4}$ x $9\frac{1}{4}$ inches, including 16 full-page illustrations and with numerous cuts through the text. Half cloth $5; full leather $8.

A compilation of original articles published at various times from 1862 to 1894, mainly in Harper's and Century magazines, this book puts in very convenient form a review of the development of the American sailing vessel up to and including the clipper ship days. The bulk of the material is published in its original form, unspoiled by interpolated notes or editorial comment.

As editor and compiler, Mr. Sawyer has exercised a very commendable self-restraint, for which the reader will be grateful. He has added to his compilation three original chapters, a foreword, and a very complete and satisfying index which tie the various sections of the text together, forming a very interesting resume of the so-called "Glorious Era" of the American merchant marine and of the developments which led up to that era.

"Our Sea Saga" will be of great interest to all ship lovers, both of the rocking chair and of the rolling sea variety.

Cost of Shipbuilding by M. Francis Carr. 250 pages with numerous tables and diagrams bound in blue buckram with gold stampings $5\frac{1}{2}''$ x 8″ published by Theo. Gaus' Sons, New York.

This is a very neat piece of bookmaking. The contents represent an enormous amount of good honest work. The author "attempts to provide a short method of calculating the cost of many different types of merchant vessels, and to eliminate the obsolete system of figuring this class of work". This attempt brings the matter down to a basis of cost of finished product per pound of steel involved for various parts of a steel hull. There is, of course, nothing new in this particular kind of short cut figuring and for each shipbuilding yard the records of experience would have to dictate the various factors involved.

The book should prove a valuable guide to the young estimator but will hardly add anything of value to the stock in trade of the veteran. It is a first edition and lacks somewhat in connective links and coherence. It also sadly lacks an index, that which is so named being simply a second table of contents. These faults we hope will be remedied in a second edition. The intrinsic value of the contents well warrants a little additional work to put them in better shape for use by the uninitiated reader.

Popular Research Narrative Vol. III. Compiled and edited by the Engineering Foundation and published by the Williams and Wilkins Company of Baltimore, Maryland, with a foreword by John Joseph Carty. $1.00.

This neat 5″ x $7\frac{1}{2}''$ book sets forth fifty brief stories of practical scientific research, each tale being written by a scientist or engineer prominently identified with the line of research being described. Some of these stories are fascinating and all of them are packed full of reliable and authoritative information.

Shipways to the Sea. By Ernest S. Clowes. 198 pages 6″ x 9″, with many halftone illustrations, maps, diagrams, and tables published by Williams and Wilkins Company, Baltimore, Maryland. $4.50.

A very readable and interesting book covering the story of the origins, development and projected future of the Inland and Coastal Waterways of the United States. The author has very evidently accomplished a very thorough research job as a foundation for his book and then has woven the findings of that research into a pleasing narrative style that throws each problem and project into a concrete, easily grasped picture. Every American who is at all interested in the economics of transportation should read this book.

Dictionary of Aeronautical Terms. By J. Vanier. 140 pages $5\frac{1}{2}''$ x $7\frac{1}{2}''$, published by the American Society of Mechanical Engineers. $1.65.

An abridged edition of a complete up-to-date aero-technical dictionary compiled by the author during many years of work translating foreign technical texts. It is arranged in parallel columns, German, English, French, and covering the same range of words, French, English, German. This makes a very convenient alphabetical arrangement for translating a term in either language to its English equivalent. The book was first used in a smaller form by the U. S. Army Air Corps Engineering School.

Transport Aviation. By Archibald Black. 350 pages 6″ x 9″ with 130 illustrations, published by Simmons-Boardman Publishing Co., New York. $5.00.

This is a second edition of the 1926 publication bearing the same name. Unlike most second editions, however, it is a completely new book, most of the material in the first edition having already become obsolete. Chapters have been added on Law, Traffic Development, Advertising, Estimating of Costs, Accounting, Investment, Insurance and Radio, none of which were covered in the first edition. The text was compiled in collaboration with a group of experts and specialists in the various branches of air transport. It gives a complete picture of Commercial Aviation in America and covers the important European developments. A complete index enables quick reference to any phase of the subject.

The Cotton World. By John A. Todd, M.A., B.L. 235 pages $4\frac{3}{4}''$ x 7″, with tables and diagrams published by Isaac Pitman and Sons, New York. $1.50.

John Todd is principal of the Liverpool City School of Commerce. He has compiled and edited this excellent handbook on cotton from lectures delivered at that school.

Five chapters complete the contents. These are headed: I. World's Cotton Supplies; II. Liverpool Cotton Market; III. Lancashire Cotton Industry; IV. World's Consumption of Cotton and Cotton Goods; V. Cotton Trade Organization. A complete index enables the reader to make ready reference to any desired information. To each chapter is appended a bibliography for further study.

While typically British and covering largely the British World Trade in Cotton and cotton goods, the text table and diagrams provide an authoritative source of information which should be of great value to all ship operators.

Auxiliaries—Ship Supplies—Marine Equipment

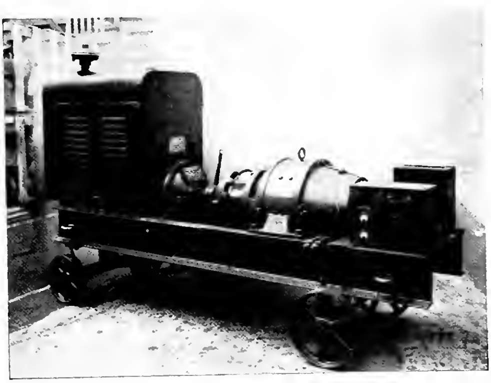
New Westinghouse Dual Drive Welding Unit

A NEW Dual Drive Arc Welding Unit has been introduced by the Westinghouse Electric & Manufacturing Company. This set rounds out a complete line of welding equipment.

The unit consists of a standard 300 ampere, single operator welding generator, a 15 h.p., alternating current induction motor and a six cylinder, 1800 r.p.m., Model P-45 Continental gas engine, all mounted in tandem on structural steel welded base. The motor operates on 220 volts, but by merely reconnecting the external motor leads and changing the line-starter coil, it can be used on 440 volts, thereby giving additional flexibility to the complete unit. The welding generator can be driven by either the gasoline engine or the electric motor by simply engaging or disengaging a slip coupling or clutch, whichever is provided.

The dual drive welding machines can be furnished in all the popular single operator ratings, stationary or portable.

There are many advantages of dual drive welders for field service, especially in the case of structural steel contractors and welding jobbers, who are continually moving from one location to another. The motor can be furnished to operate on practically all industrial power circuits wherever electric power is available. In isolated places, the engine is used for driving power, providing a flexible welding unit independent of local power limitations.



The new Westinghouse dual drive welding unit.

Largest Contract for Materials Handling Equipment Awarded

WITH the view of making Presque Isle, Ohio, a first-class port and providing a new channel for the flow of Great Lakes ore and West Virginia coal, the Hocking Valley Railroad Company has awarded the contracts for three ship ore unloaders to the Wellman-Seavers-Morgan Company and two lifting turning car dumpers to the Industrial Brown Hoist Company. This is the largest contract ever let in this country for ore and coal handling equipment.

The coal and ore dock will represent the latest in mechanical and electrical equipment design for handling bulk coal and ore. The complete pier development consists of two 120-ton lifting turning car dumpers, located on one side of the slip, each capable of handling over sixty 120-ton cars per hour and three 17-ton stiff leg ship unloaders on the other side of the slip, each capable of taking 17 tons of ore per trip, with the cycle being less than one minute.

Electric pusher locomotives will also be installed on both the coal and ore pier for handling empty and loaded cars to and from the machines.

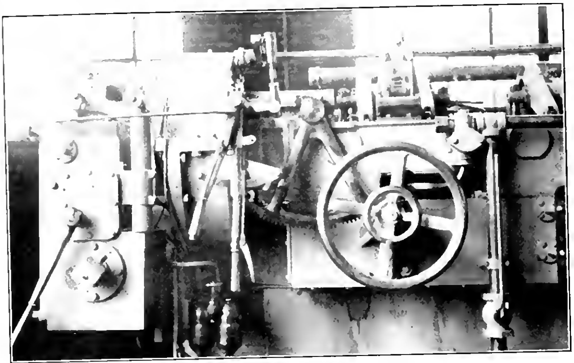
Three large substations will be installed for supplying power to the entire development. The contract for the electrical equipment, amounting to approximately $500,000, was awarded to the Westinghouse Electric and Manufacturing Company. A combination of the alternating current rheostatic and direct current variable voltage controls will be used on the unloaders. This is a new and unique feature in control of the unloaders, as it is the first time that the alternating-current or direct-current variable voltage control has been used on this equipment. The car dumpers will use the direct current variable voltage control for the main motions and the direct current rheostatic control for the auxiliary motions.

This contract is another example of the ability of the designers of electric motors to meet any required condition in the handling of large weights and high speed. Twenty-pound cartons or 120-ton ore cars are handled with the same facility and precision combined with remarkable economy.

A New 500-Horsepower, 6-Cylinder Diesel

THE new Winton unit, Model 164, has $12\frac{1}{2}$ inches bore, 21 inches stroke, and was designed to develop 500 horsepower at 240 revolutions a minute. In official shop test, however, the engine developed considerably more power than its rating calls for and showed a very high mechanical efficiency, a remarkably low fuel consumption, and an exceptionally smooth performance.

The engine, following Winton practice, is of the 4-cycle, single-acting, trunk piston type. The over-all length of the unit is 20 feet 11-3/16 inches; height from center line of crank shaft to top of engine 7 feet 5-5/8 inches; over-all width at top 5 feet $3\frac{1}{4}$ inches; over-all width at base 4 feet 11 inches.

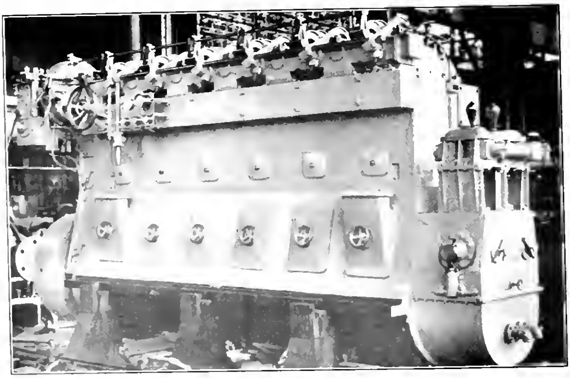

Control mechanism of the new Winton Model 164 diesel engine.

The design, like that of the 1100 horsepower unit, is noteworthy because of its simplicity and compactness. A striking change in appearance is noticeable at the forward end, where all pumps are now assembled instead of at the side. This change leaves the crankcase handhole covers free of all obstructions.

All details of design and materials throughout have been refined and improved so that on the test showing the builder's engineers declared this model to be "the smoothest, quietest, finest running 6-cylinder diesel that we have ever produced, giving the same general excellence in performance which characterizes our 8-cylinder 110-horsepower model."

Prest-O-Weld Two-Stage Oxygen Regulator

THE Oxweld Acetylene Company, 30 East 42nd Street, New York City, has added to the Prest-O-Weld line a two-stage oxygen regulator, designed to eliminate fluctuation in working oxygen pressures. This regulator, which is designated the type R-109, incorporates the stem-type valves, which have proved extremely satisfactory.


The new Winton Model 164 engine on the test block; 500 horsepower at 250 revolutions a minute.

The chief feature of the improved design is two-stage pressure reduction, accomplished through the medium of two independent sets of diaphragms, valves and springs. Instead of reducing the full cylinder pressure of about 2000 lb. per sq. in. down to working pressure, which is often only a few lb. per sq. in., in one-stage, the R-109 regulator reduces through this wide range in two stages. In the first stage the cylinder pressure is reduced through a non-adjustable reducing valve to about 175 lb. per sq. in. Leaving the first stage the oxygen passes to a second valve and diaphragm assembly, where the pressure is reduced to that desired by the operator.

When the pressure in the cylinder falls below about 175 lb. per sq. in., the first-stage valve remains fully open. It is thus automatically cut out of the system and the second-stage valve and diaghragm only are operative. The type R-109 regulator will operate with equal efficiency whether the oxygen cylinder is full or nearly empty, and the working pressure will remain constant.

Trouble sometimes experienced in the past from opening cylinder valves with the adjusting screw of the oxygen-regulator turned in, thus permitting the full cylinder pressure to enter the low-pressure gauge and rupture the Bourdon tube or damage the valve stem of seat, has been largely eliminated in this regulator.

Westinghouse Equipment For New Dollar Turbo-Electric Liner

THE construction of two super-passenger liners for the Dollar Line round-the-world service has been begun recently at the yard of the Newport News Shipbuilding and Dry Dock Company. These ships, which will be 615 feet long between perpendiculars, 81 feet beam, and 52 feet depth, and are the largest and highest powered commercial vessels so far contracted for with an American shipyard, will be propelled by turbine electric machinery developing 26,500 shaft horsepower. The designed speed is 20 knots.

The turbine generators, propelling motors for the twin screws, and control of the propelling machinery, as well as the motors and control of the electrified deck and underdeck auxiliaries of one of the ships, will be supplied by the Westinghouse Electric & Manufacturing Company.

Power for the propelling motors is furnished by two main turbine generator sets which operate with steam at 275 pounds gauge throttle pressure and 200 deg. Fahrenheit of superheat. The turbines exhaust into a vacuum of 28 inches, the condensers being installed below the turbines. Each set is rated 10,200 kilowatts at 4000 volts, 3 phase, at a speed of 2660 revolutions per minute at full power. The main generators have a closed system of ventilation, water-cooled air coolers being used. The turbines are of the well known Westinghouse combination impulse and reaction type.

The two propelling motors, driving twin screws, are of the synchronous induction type, each rated at 11,000 13,250 shaft horsepower at a speed of 125 133 revolutions per minute. The motors have an open system of ventilation which exhausts on deck. Cooling air is provided by two blowers, each driven by a 25-horsepower motor and capable of delivering 37,000 cubic feet per minute against a static pressure of 2½ inches of water.

The propulsion control employs air break main switches, operated by levers and completely interlocked to insure correct operation. Under normal conditions of operation, each turbine generator set supplies power directly to a propelling motor. However, provision has been made for driving both motors from one turbine generator set, which permits economical cruising at reduced speeds. With the latter arrangement, about 65 per cent. of the ship's full speed can be maintained.

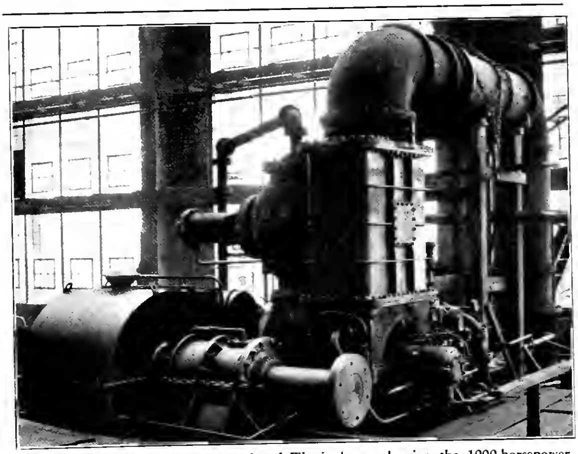
Auxiliary power is furnished by four Westinghouse turbine generator sets of 500 kilowatts each. These auxiliary sets operate at the main line steam conditions of 275 pounds with 200 degrees of superheat.

The electrified deck auxiliaries include the cargo winches, anchor windlass, warping capstans, automobile capstans, and boat hoists. There are 20 cargo winches driven by 35-horsepower motors, and four 25-horsepower winches. The anchor windlass is driven by a 75-horsepower motor, while two warping capstans are also driven by a 75-horsepower motor each. The two automobile capstans are each equipped with a 15-horsepower motor; the two boat hoists being driven by 25-horsepower machines. All of the deck auxiliary motors are of the Westinghouse waterproof type.

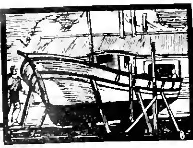
The electrified underdeck auxiliary machinery comprises the following equipment:

4 100-h.p. main circulating pumps.
2 30-h.p. auxiliary circulating pumps.
2 75-h.p. motors for the steering gear.
2 50-h.p. sanitary and deck wash pumps.
3 10-h.p. main condensate pumps.
3 5-h.p. auxiliary condensate pumps.
1 15-h.p. ballast pump.
2 7.5-h.p. fresh water pumps.
1 5-h.p. hot fresh water pump.
1 3-h.p. ice water circulating pump.
4 100-h.p. CO_2 compressor motors.
2 20-h.p. brine circulating pumps.
2 7.5 CO_2 condenser circulating pumps.
4 22-h.p. forced draft fans.
2 10-h.p. engine turning motors.
1 5-h.p. machine shop motor.

All of the foregoing underdeck motors are of the Westinghouse semi-enclosed, self-ventilated type except the 10-horsepower engine turning motors which are of the totally enclosed type.



View at the South Philadelphia Works of Westinghouse showing the 1000-horsepower exhaust turbine and reduction gear that was recently installed together with a Westinghouse 5000 square foot all-welded steel condenser and auxiliaries on board the Susan B. Luckenbach to increase her shaft horsepower. It is expected to increase the ship's speed from 10 knots to 12 knots with no additional fuel consumption.

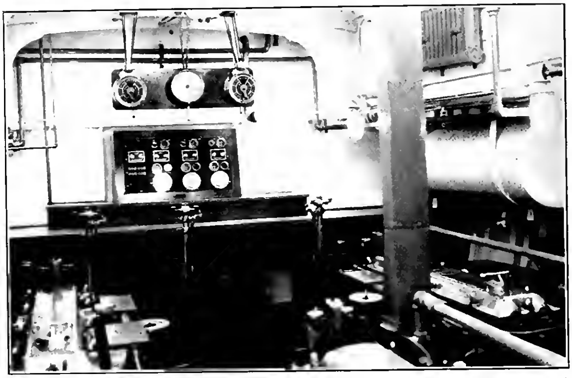


Workboats and Their Power Plants

The Revenue Cutter Tingard

Hall-Scott Motors Performing 100 Per Cent. Under Difficult Conditions

THE Hall-Scott Motor Company of Berkeley, California, contracted with the United States Coast Guard Service to re-engine the cutter Tingard under a guarantee to give her 15 knots speed with satisfactory fuel economy and reliable performance under sea service conditions. This cutter, under recent trials, performed very satisfactorily, making an average speed of 15.1 knots at engine speed of 1825 revolutions a minute; 12½ knots at 1400 revolutions a minute; and 8½ knots with only one engine out of three operating. At full speed she used 54 gallons of gasoline an hour, which works out at about 0.6 pound per brake horsepower hour.



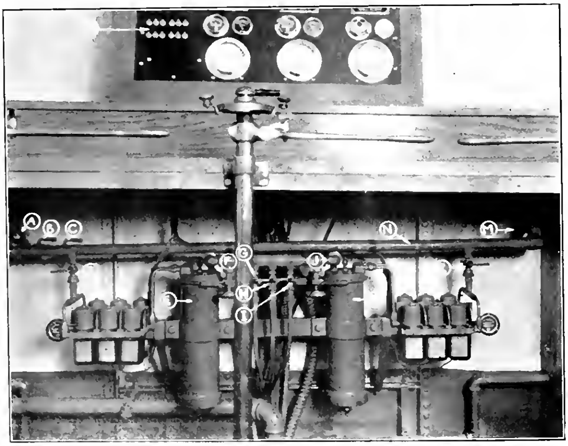
The engine room of the Tingard showing location of the three engines and of the control stand at the forward bulkhead.

Tingard is a converted subchaser of the standard wood construction type. Her hull characteristics are:

Length over-all	110'0"
Beam, molded	14'8¾"
Draft on trial trim	5'11"
Displacement, tons	75

As originally built and equipped, she had three gasoline engines and triple screws. These engines were subsequently removed, together with the central propeller and its shaft, and the craft was converted to a diesel, twin-screw motorship.

In the conversion recently completed, the two diesels were removed, the central shaft restored, and three Hall-Scott, 175-horsepower, 6-cylinder, 5- by 7-inch marine type gasoline engines were installed

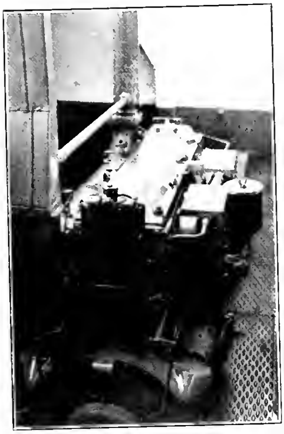


FUEL SUPPLY SYSTEM

The illustration at left is a close-up of the arrangement worked out by Hall-Scott engineers for insuring a uniform supply of fuel to each of the three engines. A key to the identifying letters follows:

(A) After port tank shut off valve.
(B) Forward port tank shut off valve.
(C) Forward starboard tank shut off valve.
(D) Port autopulse pump suction shut off valve.
(E) Gasoline strainer for port pump.
(F) Port pressure valve.
(G) Port engine shut off valve.
(H) Center engine shut off valve.
(I) Starboard engine shut off valve.
(J) Starboard pressure valve.
(K) Gasoline strainer for starboard pump.
(L) Starboard autopulse pump suction shut off valve.
(M) After starboard tank shut off valve.
(N) Gasoline suction manifold.
(O) Switches for testing fuel pumps.

The Tingard on her trials on the Oakland estuary.



Close-up of one of the Hall-Scott motors installed on the Tingard.

with 3 to 1 reduction gear connecting them to the propeller shafts. New propellers were designed for the job by the Pitchometer Company. The two outboard propellers are right and left hand screws turning outboard, 36 inches diameter and 37-inch pitch. The center propeller is a right hand screw of 36 inches diameter and 35½-inch pitch. So well have they been calculated that at full speed the power absorbed by each wheel is identical, the engines turning at exactly the same speed.

Hall-Scott engineers worked out an excellent system of fuel supply control for these three engines with a centralized arrangement which is mounted on the forward engine room bulkhead amidships under the engine room telegraph indicators and the engine instrument board, and back of the engine operating controls. The details of this gasoline fuel supply manifold are clearly shown in an illustration. This control is so well balanced and the engines so responsive that on maneuvering trials at engine speed 1600 corresponding to 13.75 knots the hull was actually making sternway in 31 seconds.

The Tingard is now at sea on duty and, according to the officials of the Coast Guard Service, she is performing all tasks that are required of her with satisfactory efficiency.

Pacific Boat Yard Notes

Parke & Kibele, Terminal Island, San Pedro, have under construction a 95-foot fishing boat for John Gabelich of San Pedro. The boat will be powered with a **Western-Enterprise** diesel engine. This yard is also building a 120-foot fishing boat for H. E. Morgan, the power plant selection not having been announced.

General Marine Works of San Diego has just completed a 45-ft. yacht for Chas. D. Boynton. She is powered with a 45-horsepower **Atlas** diesel and has accommodations for five, with a cruising radius of 4000 miles.

The **Welded Steel Shipbuilders, Inc.**, has been incorporated in Los

(Continued on Page 33, Blue Section)

Aerial view of the Hall-Scott Motor Car Company plant at Berkeley, California. The buildings shown here, devoted exclusively to the manufacture of high class gasoline engines for marine and industrial purposes, have a floor area under roof of more than 4½ acres.

New Diesel-Electric Lightship For Blunts Reef

WHEN the first of three sister lightships building at Albina Marine Iron Works, Portland, Oregon, motored into San Francisco Bay, Superintendent H. W. Rhodes, of the Lighthouse Service, invited a number of San Francisco marine experts to inspect the boat. These experts looked the craft over with a very critical eye, and they were one and all of the opinion that the Albina Marine Iron Works had produced an excellent hull. Much praise was in evidence for the excellent work done in ship fitting, riveting, pipe fitting and installation of the machinery.

The new Blunts Reef lightship.

This first ship is to have her station on the exposed Blunts Reef, off Cape Mendocino, on the Northern California Coast.

She is 133.3 feet over-all length and 108.9 feet in length on the water line. Her molded beam is 30 feet and under her usual load trim she has a draft forward of 11.9 feet and a draft aft of 13.3 feet. The molded depth of her hull is 23 feet and the gross tonnage is 630.

The most prominent features of her upper lines are two heavy tubular steel masts topped by powerful incandescent lights and the large specially designed diaphone fog signal. This signal is mounted on top of the engine room skylight. The horn has four openings, and the electrical control of the horn is synchronized with the control of the radio beacon signals. In connection with this apparatus, navigators will be furnished with a table showing the distance traveled by sound for any given number of seconds. By holding a stop watch on the time interval between the radio signal and the reception of the sound signal, the navigator may determine from the table with reasonable precision the distance between himself and the lightship. It is confidently predicted that this new arrangement of diaphone signal and radio beacon will be of great assistance to all vessels equipped with radio direction finders or radio compasses.

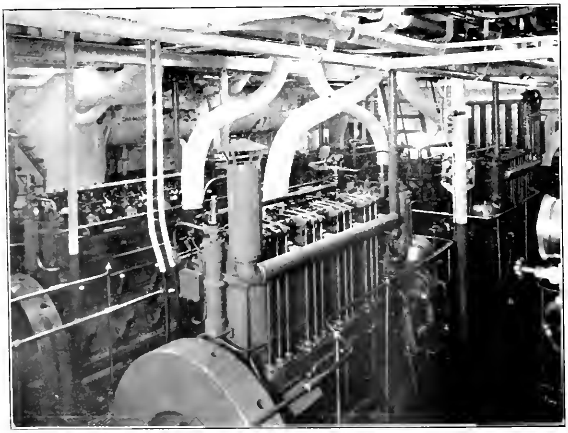
The power plant of the Blunts Reef lightship is of the diesel-electric type. A double armature shunt-wound, 125-volt, General-Electric marine propulsion motor is directly connected to the propeller shaft. This motor delivers 350 horsepower at 300 revolutions a minute. The thrust of the propeller is taken on a Kingsbury bearing mounted on the motor bed-plate. The propeller is a 4-bladed bronze wheel supplied by the Albina Marine Iron Works. Electric power for the propulsion motor is furnished by four 4-cylinder, 8- by 12-inch, 4-cycle, trunk piston, Winton diesel engines delivering 125-horsepower each at 450 revolutions a minute. Each of these engines is directly connected to a 75-kilowatt, 125-volt, General-Electric generator. For auxiliary purposes, two single-cylinder, 12-horsepower Cummins diesel engines are installed. One of these is directly connected to a 7½-kilowatt, 125-volt, General-Electric generator. The other has a similar 7½-kilowatt generator clutch-connected on one end and a Winton compressor clutch-connected on the other end.

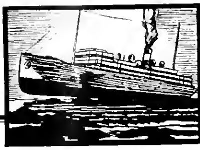
Prominently displayed on the forward bulkhead of the engine room is a board carrying a battery of Pacific tank gauges installed by the Pacific Tank Gauge Company of San Francisco. By the use of these gauges the engineer in charge may instantly determine the quantity of liquid in any tank on the ship with practically mathematical precision.

For convenience in handling weights in the engine room, three Yale & Towne 2-ton chain blocks operating on overhead rails are installed.

For regular air service there are two Worthington, 7 by 6, double

(Continued on Page 25, Blue Section)


The engine room of the new lightship featuring the four 4-cylinder, Winton-General Electric diesel generating sets.



Marine Insurance

Edited by JAMES A. QUINBY

Policy Payments

A Diatribe Against Competitive Pressure as a Substitute for Contract Conditions

IN every business since the world began, competition has resulted in a lowering of rates. Inevitably, such rate lowering, if carried to extremes, is suicidal. A crisis results, reorganization becomes necessary, and the consumer bears the cost of warfare.

These truths are so axiomatic as to be distasteful for their very repetition, yet the evils they portray still exist. In the two great branches of industry with which we are chiefly concerned, the steamship business and the insurance business, these evils are rampant as of yore. Not that the rate cutting always takes the form of an out-and-out lowering of freights or premiums. That would be far too crude. There are so many other ways in which rebates may be extended to a valued customer, and this valued customer kept from the clutches of a competitor who is busy thinking up ways and means of offering other rebates. The term "rebate," as here used, includes any form of favor by which the even balance of privilege is disturbed among customers holding similar contract rights.

ROUNDELAY

"And so,"
The Underwriter said, "It's plain
The country's headed for the bow-wows. In the main
It's due to just one thing: Insurance rates
Are far too low."

"It's tough,"
The Shipping Magnate cried, "the national debt
Is clearly due to this one cause—the freights we get
Are not enough."

"And I,"
Spoke up the Man upon the Street, "I think
The nation trembles now upon the brink
Of ruin just because insurance rates
And intercoastal ocean freights—
Are high."

J. A. Q.

Carriers Recognize the Evil

Certain industries and commercial enterprises have reached a stage of development which enables them to curb unfair competitive methods by means of strict regulation. Neither steamship owners nor marine insurers fall within this category. Marine underwriters are proud of boasting that theirs is the one remaining free field in the realm of insurance; and ocean carriers in our own Pacific Coast trade are driven to protective measures within the imperfect circle of the Intercoastal Conference.

Only recently the United States Intercoastal Conference passed two new rules designed to stop certain practices by members. These new rules have to do with claims and read as follows:

"Rule 5-B—Carriers' liability. In event of loss or damage the carriers' liability shall not exceed the invoice value at the point of shipment, plus freight, if paid, and insurance, and in no event will any commission or brokerage over the foregoing be paid or allowed."

"Rule 5-C—Claims covering partial loss or damage to goods moving under released liability rate will only be settled on the proportionate amount of such loss or damage."

Why are such rules necessary? The bills of lading used by intercoastal carriers all cover the points set forth in the rules. If the carriers lived up to their bills of lading, there would be no necessity for restating such regulations in the form of prohibitions by the Conference.

The answer is plain. In lieu of cutting conference freight rates, certain carriers have been paying damage claims for which they are not legally liable, in order to build up goodwill among valued shippers. If such favors were extended to all shippers, the results, though undesirable, would at least be equitable. But the good-will sought is that of the powerful shippers. The Great Eastern Pumpernickel Company demands and obtains the waiver of a carrier's bill of lading defenses; but John Q. Jones, who ships one crate of household goods, finds his carrier standing rigidly upon the terms of his contract.

The Underwriters' Problem

Marine insurers have organizations similar to the Intercoastal Conference. They have similar problems to meet; but to date have shown no great amount of effort in overcoming their difficulties.

It is true that rates, as such, have become reasonably stabilized for standard voyages; the two glaring evils remain, namely—

(1) The practice of granting additional coverage for standard rates, and

(2) The practice of making gratuitous payments of losses not covered by the policy.

These devices constitute different means to the same end. Both are fostered by powerful brokers and both result in discarding the spirit of the insurance contract and substituting therefor the spirit of competition. An ordinary marine insurance policy covers cer-

tain specific risks, such as fire, perils of the sea, general average, and the like. Some policies cover only a portion of these risks. And yet, for no increase in rate, an underwriter may be forced to or voluntarily agree to include additional hazards which are entirely extraneous.

Harter Act Insurance

Or, if the coverage and rate are on a fair basis, the underwriter, upon the occurrence of a loss not actually covered by the policy, may voluntarily (?) make a "policy payment" gratuitously and "without prejudice." Famous last words: "Without prejudice." Will business men never learn that nothing can be done without prejudice to repetition in a similar situation?

An example that has recently occurred on a westbound intercoastal voyage illustrates our point. Heavy damage to cargo was caused by the negligent act of a member of the crew in poking a hole in a soil pipe leading through a cargo compartment. There was no peril of the sea, no fire—no one of the hazards usually covered by a marine policy. The damage was due either to an error in navigation and management of the vessel or to negligent care and custody of cargo, or the shipowner's failure to provide a seaworthy vessel at the start of the voyage.

The Harter Act makes a shipowner liable for faulty care and custody of cargo, but exempts him from liability for errors in management of the vessel so long as he uses due diligence to provide a seaworthy ship prior to the inception of the voyage. For this additional hazard to cargo which may be occasioned by an error in management, and for which nobody is liable, underwriters have a special coverage which the assured or broker may obtain at an additional premium.

But when the loss occurs and twenty or thirty underwriters have claims from eighty or ninety valuable clients, are these valuable clients told to run along and be sure to take out Harter Act coverage next time? They are not. They are told that this is a payment without prejudice, and nobody else would do this for you, and, mind you, this isn't a precedent. To which they nod their heads solemnly and wonder at the strange ways of underwriters, since most of them have been through the mill before and know that practically all insurers act the same way.

The indictment is not placed against an underwriter who issues an "all-risk" policy or other comprehensive policy, but against those who pay losses with the full knowledge that such losses cannot, by any stretch of imagination, be recoverable under their policies.

From a comfortable seat on the sidelines, it looks as if marine underwriters should turn from their efforts to devise new policy conditions and develop an agreement, with teeth in it, requiring members to abide by policy conditions which already exist.

In the long run, both parties to the insurance contract will benefit by a more strict adherence to the conditions of the policy. Underwriters will be free from the competitive rebate, and the assured will, in the end, pay less for coverage which is definitely and equitably administered.

Failure of Machinery Bases Tower's Liability

THE case of Cranberry Creek Coal Co. vs. Red Star Towing and Transportation Co., 33 F (2d) 272, contains broad statements concerning machinery damage which will prove unwelcome to P. & I. and tower's liability insurers.

The facts of the case indicate that a tug, towing a series of barges, became disabled due to the cracking of a high pressure cylinder. The barges proceeded to pile up on a dock and one of them sank as a result of the accident.

The court found that the tug-owner was liable for the damage.

"As in collision, so in towing; a vessel does not, of course, become liable for all damage arising from her navigation or unfitness; she is not an insurer, and the injured party must establish some fault through neglect or affirmative misconduct. But there are situations in which the law does not put the duty upon the sufferer to make proof at the outset; either because the facts are especially within the owner's knowledge, or, as in the case of collisions with an anchored vessel, because usually there must be some fault, it is thought just to require the owner to explain, and if he does not, to charge him. A failure of machinery or gear is within this class of cases and the owner's duty is often spoken of as the defense of 'inevitable accident.' Strictly, it is no defense at all, but a true presumption; that is to say, a duty laid upon him to supply proof which costs him if he fails.

This duty extends not only to disclosing what happened, but what was done to avoid, and what would have been necessary to prevent it. After he has done so, no doubt the burden remains upon the injured party to show that the necessary care was not beyond what the law exacts, but the owner is in no position to demand consideration of that question until he has made his proof. We have enforced this rule under a variety of circumstances (The J. Rich Steers (C.C.A.) 288 F.

319; In re Reichert Towing Line (C.C.A.) 251 F. 214; The Westchester (C.C.A.) 254 F. 576; The Columbia (C.C.A.) 255 F. 515); and it is not at all peculiar to us (The Olympia, 61 F. 120, 122, 123 (C.C.A. 6); The City of Camden, 292 F. 93 (C.C.A. 3); the Merchant Prince (1892) Prob. Div. 179 (C.A.). It makes no difference whether the case involves a collision, towage, or, for example, the local statute against dumping refuse in New York Harbor.

In the case at bar the respondent showed nothing at all as to what it had done to provide a seaworthy stud. The tug was 25 years old at the time, and, so far as appeared, the stud may have been in continuous use all the time. When she was overhauled shortly before the break, nothing was done to ascertain that it was still serviceable. Whether metal degenerates with age under such circumstances we cannot tell, nor how often such a member should be examined and replaced. The reason for the break we are left to guess by inspection. It was quite immaterial that the nuts were screwed home; that would have been important only if they had worked loose. The proof stopped precisely at the critical point; it showed what the defect was, but not what was necessary to detect and provide against it. The liability was therefore established."

Unseaworthiness Bars Harter Act Defense

AN interesting case deciding timely points as to seaworthiness and time to sue clauses is the Callabasas, reported in 1929 A.M.C. 1293.

The good ship Callabasas damaged a quantity of sugar which was stowed in her No. 3 hold during a voyage from Porto Rico to Boston. The damage was due to sea water and oil, which gained ingress to the cargo compartment because of leaky margin plates in a tank in No. 3 hold.

Two defenses were urged by the shipowner:

(1) Failure to file suit within six months as provided in the bill of lading.

(2) That the damage was caused by negligence of the officers or crew in the management of the vessel under the Harter Act.

As to the first defense, the facts showed that notice of claim was properly given, and that the damaged sugar was loaded on March 1, 2, and 3. The bill of lading required that suit be commenced within six months after delivery of the goods to the carrier. Suit was filed on September 3.

Time Clause Held Valid

It is interesting to note that the time to sue clause in this case runs from the delivery of the goods to the carrier and not, as is customary, from the time of discharge or arrival at the port of destination. The purpose of this rather clever device is twofold. It gives the impression of open-handed generosity in the length of time ostensibly allowed, and lulls the consignee into a false sense of security, for the six months period, under casual reading, is usually taken to run from the time of discharge. The court disposes of the time defense in the following language:

"The time stated within which the suit must be commenced is a reasonable time. A 90-day period having been held reasonable by the Supreme Court (Mo., Kan. & Tex. Ry. v. Harriman, 227 U.S. 657), and a three months period having been held reasonable by the Circuit Court of Appeals in this circuit (Aeolus; Schnell vs. United States, 1929 A.M.C. 286, 30 F. (2d) 676).

It was not necessary for respondent and claimant to set up as a defense by answer the alleged failure of the libellant to bring suit within the time stated in the bill of lading, as the commencement of the suit within the time stated in the bill of lading is a condition precedent to the right to sue, and failure to comply with this provision is bar to the suit.

Respondent and claimant seek to divide the shipment into parts and set the time for the commencement of the suit running from different periods; but that does not seem to me to be the proper construction of paragraph 22 of the bill of lading above quoted.

Libelant's shipment of 27,650 bags of sugar was an entire contract, and the 'delivery of the goods to the carrier' was not complete until all was delivered, which was on March 3, 1925, when the carrier receipted by the bill of lading for the delivery of it of the 27,650 bags of sugar; and the commencement of the suit on September 2, 1925, was a compliance with paragraph 22 of the bill of lading, the suit being 'commenced within six months after delivery of the goods to the carrier.'

Court Finds Unseaworthiness

According to the testimony of the master of the steamship Callabasas, the cause of the damage was 'leaking in the margin plates from the No. 5 tank.' No. 5 tank was in No. 3 hold.

And also, according to the testimony of the master of the steamship Callabasas, in reply to a question, "Did you have any damage to the vessel during this voyage?" he answered, "Well, she was leaking in the margin plates."

Claimant contends that the damage was caused by pumping water into the double-bottom tanks of the vessel at Boston, before all of the cargo was discharged, but the testimony of the master does not sustain this contention because in answer to the question, "Before the cargo discharged did you give orders to fill the double-bottom tanks?" the master answered "No."

With the double-bottom tank in a leaky condition as to its margin plates, the vessel was not in a seaworthy condition as she was not reasonably fit to carry the cargo she had undertaken to transport. Silvia, 171 U. S. 462, 464.

It is true that the Harter Act was incorporated in the bill of lading, but in order to avail themselves of it for the defense of negligence in the management of the vessel, the respondent and claimant are bound to show either that the ship was seaworthy at the commencement of the voyage, or that due diligence was used to make the vessel seaworthy; but they have failed to do so, as no evidence was offered in support of either seaworthiness or due diligence, Herman vs. Compagnie Generale Transatlantique, 243 Fed. 859; Governor Powers, 243 Fed. 961; John Twohy, 279 Fed. 343.

The respondent a n d claimant had the best opportunity to know how the damage occurred, and the burden of proof as to those facts was upon them, American 1927 A. M. C. 1263; Burgondier, 1928 A. M. C. 1635, and an inference arises against them from the nonproduction of the engine-room log and sounding record, although noticed to produce them, and from the nonproduction of the chief engineer and carpenter as witnesses."

Marine Underwriters Class Meetings

At its second meeting of the year on Monday, October 21, the Study Class of the Assocation of Marine Underwriters of San Francisco was addressed by M. A. Cremer and Clifford Conly.

Mr. Cremer, a former Trade Commissioner for the Department of Commerce, discussed trade and port conditions on the East Coast of South America. He commented on the crowded port and dock facilities at Rosario, Montevideo, and other ports, and gave an interesting description of the characteristics of the peoples of Argentine, Brazil and Uruguay, pointing out that in Argentine and Uruguay the great mass of population was centered in capital cities.

Clifford Conly, president of the Board of Fire Underwriters of San Francisco, described the functions of the State Underwriters Board in connection with isolating marine and fire risks. For the past few years, there has been continual dissension between the underwriters of the two fields, caused largely by the practice of the marine fraternity in covering strictly fire risks on inland marine or other quasi marine forms of policies. Mr. Conly outlined the procedure by which the newly formed interstate board intends to restrict the operation of marine underwriters in the insuring of fire risks.

The third meeting of the Study Class held on November 4, was addressed by Walter Vivell and A. E. Stow.

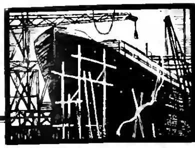
Mr. Vivell, average adjuster for Cosgrove & Company, took for his subject "Practical Difficulties in the Interpretation of the Inchmaree clause." He traced the development of the clause from the time of the "Investigator" and "Inchmaree" cases and pointed out that most of the decisions had to do with the theory that an underwriter under the clause is liable for resultant damage arising from a latent defect, but is not liable for the part in which the defect occurs. As the clause specifically mentions bursting of boilers and breakage of shafts, it has been the custom of Pacific Coast underwriters to pay for the part in which a defect occurred providing that part was a boiler or shaft. The speaker pointed out that the legal liability for such payments has not been determined and rests upon the interpretation of the specific coverage of shafts and boilers in the clause itself.

Mr. Stow, in charge of personal injury prevention for the American-Hawaiian Steamship Company, discussed "The Shipowner's relation to his P. & I. Risks," characterizing the ship as the rules of revenue upon which the shipowner, cargo owner, underwriter and admiralty attorney depend. He felt that the rates for Protection and Indemnity Insurance should reflect the differences in moral hazard and experience rating among shipowners. Mr. Stow's comments upon ambulance chasing and other pernicious activities of the legal fraternity were pertinent and heartfelt and his talk was extremely valuable in that it gave the members of the class an excellent taste of the shipowner's viewpoint.

A NEW BOOK

Forty Years with General Electric. By John T. Broderick. 220 pages 5″ x 7½″, with numerous portraits published by Fort Orange Press, Albany, New York. $2.00.

This book is a human interest story of the spirit and growth of a great corporation as reflected in the aims, ambitions and work of its founders and their successors.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

SOME RECENT SHIPBUILDING ORDERS.

Los Angeles Shipbuilding Co., San Pedro, has an order from the Union Oil Co., Los Angeles, for a 3000-bbl. oil tank barge.

American Bridge Co., Pittsburgh, has an order from the Hillman Transp. Co. for five standard coal barges.

Bath Iron Works, Bath, Maine, has an order for a diesel yacht to be 243 ft. 9 in. length over - all; 36 feet beam, and 21 ft. 7 in. depth; powered with two 1100-horsepower Winton diesel engines.

Defoe Boat & Motor Works, Bay City, Michigan, has recently booked several interesting orders for pleasure craft. These include a 75-ft. wood yacht, gas engine powered, for R. E. Klages of Columbus; two 75-ft. wood yachts, powered with diesel engines, one for Earl Dawson of Detroit, the other for owner not named.

For steel construction, this firm has received an order from I. Zellerbach of San Francisco for a 800-horsepower diesel yacht to be 142 ft. long, 24 ft. 6 in. beam and 9 ft. draft, of 15 miles speed; also an order from Geo. W. Loft of New York for a 900-horsepower diesel yacht, to be 110 ft. long, 18 ft. 6 in. beam, and 5 ft. 4 in. draft, and 18 miles speed.

Dravo Contracting Company, Pittsburgh, has an order for two steel carfloats for Reading Co., Philadelphia.

Federal Shipbuilding & Drydock Company, Kearny, N.J., has received from the Standard Shipping Co., New York, an order for two steam tankers to be 525 ft. between perpendiculars, 74 ft. beam, 28 ft. 6 in. loaded draft, and to have a loaded speed of 10.5 knots. Steam turbines will be used for propulsion, steam being supplied by high pressure, water-tube boilers.

This yard also has an order for two 175-ft. welded oil barges for the Oil Transfer Company of New York and one 160-ft. oil barge for the United Petroleum Transp. Co.

Howard Shipyards & Dock Co., Jeffersonville, has an order for a steam towboat for the Dixie Sand & Gravel Co., Chattanooga, to be 123 ft. long, 28 ft. 6 in. beam, 5 ft. depth, with high pressure steam engine and fire-tube boilers.

Nashville Bridge Co., Nashville, Tenn., has recently received orders for two dry-docks, 48 by 24 by 5 ft.; two dredges, one to be 135 by 30 by 8 ft. and the other 150 by 36 by 6 ft.; and twelve deck barges.

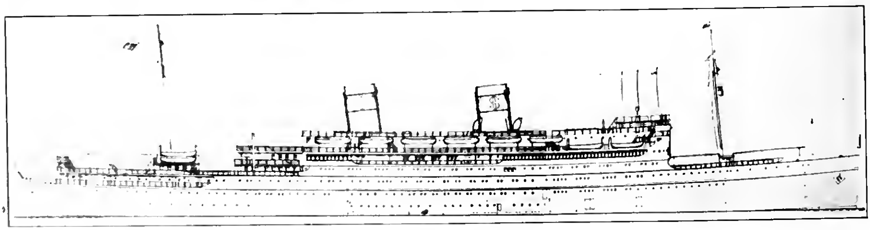
Newport News Shipbuilding & Drydock Company, Newport News, Virginia, has entered contract for the construction of the two largest vessels yet to be contracted for in an American shipyard. These are the two passenger and freight round-the-world liners for the Dollar Steamship Company of San Francisco. They are to be 653 ft. over-all, 81 ft. beam, and 52 ft. depth. They are to have turbo-electric machinery developing a sea speed of 20 knots. Delivery of the first vessel is scheduled for October 1931 and the second in February 1932.

The Pusey & Jones Corp., Wilmington, Del., has an order from R. R. M. Carpenter of Wilmington for a 130-ft. twin screw, diesel yacht to be powered by two 400-horsepower Winton diesel engines.

Sun Shipbuilding & Drydock Co., Chester, Pa., has an order from the Standard Transport Co. of New York for two single-screw diesel oil tankers to be 480 ft. long, 65 ft. 9 in. beam, and 27 ft. depth, keels to be laid next April and May.

United Dry Docks, Inc., Staten Island Plant, New York, has received an order from the City of New York for a steam ferryboat to be 267 ft. over all, 66 ft. beam, 13 ft. 9 in. loaded draft; and to develop a speed of 12 knots. Double compound engines will develop 4000 indicated horsepower, and steam will be supplied by four water-tube boilers. The vessel will have seating capacity for 1650 passengers and will be able to carry 32 vehicles. The cost will be $950,000. This yard also has an order for a 122-ft. lighter for the New York Central Railroad to be powered with a 540 horsepower diesel engine.

The Charles Ward Engineering Works, Charleston, W. Va., has an order for a single screw, steel, diesel tug for the U. S. Engineers Office at Wilmington, North Carolina, to be 64 ft. 6 in. length. This yard also has an order for two turbo-electric, twin-screw, tunnel towboats



The preliminary outboard profile plans of the new liners for the Dollar Steamship Company.

for the Mississippi Valley Barge Line Co., of St. Louis. These will be 200 ft. length, 40 ft. beam, and 10 ft. 6 in. depth.

General Engineering & Drydock Company, Oakland, Calif., has received contract for a fourth Coast Guard cutter similar to the three now under construction at this plant. These are of turbo-electric propulsion, 250 feet long, 42 feet beam, and speed of 18 knots. The cutter will cost about $1,000,000.

Bethlehem Shipbuilding Corp., Fore River Plant, Quincy, Mass., has received an order from the Sinclair Navigation Co., 45 Nassau Street, New York, for the construction of two tankers to be 416 feet between perpendiculars.

This company has recently booked an order for three gas engine powered fishing vessels of 200 gross tons each for the General Sea Foods Corp.

Another order reported for this yard is two self-propelled oil tank barges for the Sinclair Oil Company, 45 Nassau Street, New York. One is to be of 5000 barrels capacity and driven by a 500-horsepower diesel; the other of 2500 barrels capacity is to be powered by a 275 horsepower diesel, giving a speed of 9½ and 9 knots respectively.

Manitowoc Shipbuilding Corporation, Manitowoc, Wis., has an order from the Standard Oil Company of Indiana, Chicago, Ill., for a single-screw steam tanker to be 400 feet long, 53 feet 3 inches beam, 27 feet depth, to be powered by a triple-expansion, reciprocating steam engine developing 2500 indicated horsepower, steam to be supplied by two single-end Scotch boilers.

SHIPBUILDING WORK IN PROSPECT

PLANS COMPLETED FOR LARGE CRUISER

Plans have been completed for the new de luxe cruiser for G. Allan Hancock of Los Angeles. G. Bruce Newby, naval architect, of San Pedro, designed this craft, which represents some revolutionary features in pleasure boat design, the lines following the sweeping lines of the new light cruisers. The cost will be about $750,000.

The vessel will be named Volero III. She will be 193 feet long overall, 30 ft. beam, and 11 ft. 6 in. draft, and of 890 tons displacement. Her power plant will consist of twin 850-horsepower directly reversible Winton diesel engines, which will drive her at a cruising speed of 14 knots. All auxiliaries are to be electrically operated, power being supplied by two 75-kilowatt generators driven by two 112-horsepower Winton diesel engines and 20-kilowatt generators operated by Kingsbury shafts from the main engines. The vessel will have accommodations for 18 persons and a crew of 12. A cruising radius of 10,000 miles will be assured by fuel oil capacity of 60,000 gallons and fresh water supply of 12,000 gallons. The hull will have nine steel water-tight transverse bulkheads to provide greater safety in the event of accident to the hull. Auxiliary equipment specified include a Sperry gyro-compass, Kolster direction finder, forced draft ventilation, and refrigerator capacity of 3000 cubic feet.

NEW FISH PATROL BOAT FOR CALIFORNIA

Bids were opened at the office of the state purchasing agent at Sacramento, November 18, for the construction of a patrol boat for the California Fish and Game Commission. She will be of wood construction, 86 ft. long, 18.6 ft. beam. The boat will be equipped with a 200-horsepower, directly reversible diesel engine.

The patrol boat is to be used to enforce laws on fishing gear, catch limitations and seasons. She will also be equipped with an elaborate laboratory for scientific purposes, gear for trawling, and with accommodations for six experts, in addition to a crew of four. The craft will have refrigeration for ship's stores, a small cargo hold aft, and fuel tanks for 3600 gallons of oil.

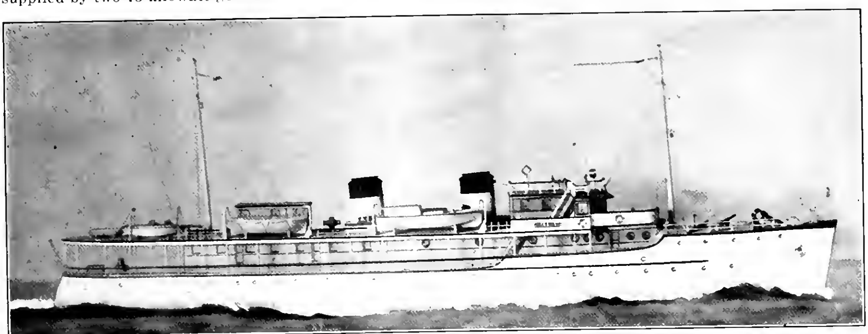
San Diego Marine Const. Co. submitted low bid of $57,801.

NEW PASSENGER VESSEL FOR CATALINA ISLANDS

According to an announcement from the office of Joseph H. Patrick, western manager of the Wrigley interests at Los Angeles, plans are being prepared for the construction of an additional passenger vessel for the Wilmington Transportation Co. service between Wilmington, California, and the Catalina Islands. Two separate designs are being drawn up by William Lambie and G. Bruce Newby of San Pedro, and will await the approval of William Wrigley, Jr., in Los Angeles next month.

The vessel will have the approximate dimensions of 350 feet length, 65 feet beam, and will have a capacity for 3000 day passengers. Both direct diesel and diesel-electric power plants are being considered.

The Wilmington Transportation Company placed the steamer Catalina in service in 1924.



Artists's drawing of the $750,000 cruiser for G. Allan Hancock of Los Angeles.

McCORMICK LINE TO BUILD SIX FREIGHTERS

According to reports from Washington, but not confirmed by the San Francisco office up to date of going to press, the McCormick Steamship Company of San Francisco is to build six freighters for its Pacific-Argentine-Brazil Line under the favorable provisions of the Merchant Marine Act, 1928.

This line was recently granted a mail contract by the Postoffice Department for the carriage of mail between Pacific Coast ports and the east coast of South America, and Charles L. Wheeler, vice-president and general manager of the company, has recently returned to San Francisco after negotiating for a loan from the Shipping Board for $5,625,000, representing three-quarters of the cost of building these vessels, which will cost an estimated total of $7,000,000.

The ships will be modern in every respect, and will be equipped with refrigerated cargo space and accommodations for a limited number of passengers, similar to the vessels now in service, which carry 15 passengers. The speed of the proposed vessels will be 13 knots.

PANAMA MAIL LINE PLANS NEW VESSELS

The Panama Mail Steamship Company, 2 Pine Street, San Francisco, Edward T. Ford, president, has applied to the Postoffice Department at Washington for a contract for the carriage of mail between San Francisco and Puerto Colombia. Mr. Ford, who is also vice-president of the Grace Lines, Inc., in charge of Pacific Coast affairs, also is applying for a contract for the carriage of mail between San Francisco and Valparaiso. Both these routes have been certified by the Postoffice Department for mail contracts.

With the granting of the mail contracts, the Panama Mail Line plans the building of two 18-knot passenger and freight steamers for the intercoastal route, touching at Panama, Colombia, and Havana. Plans call for turbo-electric drive, with capacity for 200 first-class and 100 intermediate class passengers. The vessels would be large enough to carry, in addition, 8000 tons of cargo and 1000 tons of refrigerated cargo.

BIDS HAVE BEEN SUBMITTED ON STANDARD TANKERS

Bids were opened recently at the offices of the Standard Shipping Company, 26 Broadway, New York, a subsidiary of the Standard Oil Company (N.J.) for the construction of one, two, and four tankers. These vessels are to be 480 ft. between perpendiculars, 64 ft. 9 in. beam, 27 ft. 4½ in. draft, displacement of 19,100 tons, and a total deadweight cargo capacity of 13,600.

Bids were asked on four types of machinery, namely, high pressure steam turbine drive; diesel-electric drive, direct-diesel drive, and quadruple expansion steam engine drive, all single screw.

BIDS OPENED FOR U.S. LINES VESSEL

Bids were opened November 15 for the construction of two, three, four, five and six high speed transatlantic liners at the office of the United States Lines, 45 Broadway, New York. The construction of these vessels is contingent upon the award of favorable mail carriage contract from the United States Post Office Department and the granting of a 75 per cent loan from the Shipping Board loan fund. Two vessels will be built as a start, with others to follow.

The vessels will have the following characteristics:

Length over-all	705′0″
Length between perpendiculars	666′0″
Beam molded	82′0″
Depth to A Deck	66′0″
Depth at D deck (freeboard deck)	38′6″
Loaded draft	30′0″
Deadweight tonnage	12,250
Gross tonnage	27,000
Sea speed, knots	20
Specified trial speed, knots	22
Passenger accommodations:	
First cabin	604
Tourist	490
Third class	200
Crew	397

The vessels will be propelled by twin screws and will be powered with geared turbine machinery, consisting of two sets of triple, series, reaction-type turbines, with single reduction gears. Steam is to be supplied at 400 pounds per square inch pressure by six drum-type boilers having three or more drums each.

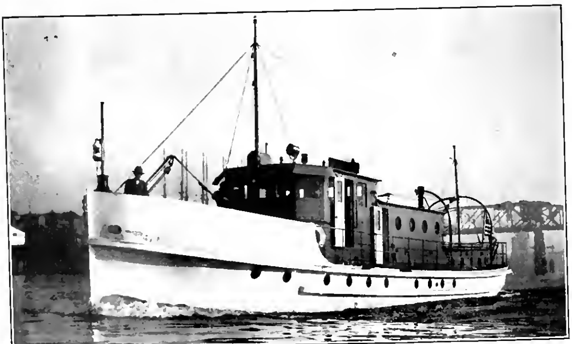
Bidders were given the privilege of submitting alternate bids on turbo-electric propulsion. The machinery plant will develop a total horsepower of about 30,000 and the specified fuel consumption is to be within 0.65 pound per horsepower hour for all purposes.

The vessels are to be furnished and equipped with every modern convenience and luxury known to sea travel.

TENDER WESTDAHL DELIVERED TO COAST SURVEY

The tender Westdahl has been completed for the exacting work of the U.S. Coast and Geodetic Survey by the Albina Marine Iron Works, Portland, Oregon. She is 77 feet over-all, 15 feet 5 inches beam, and 6 feet draft; speed 9 knots.

This new 90-ton vessel is a marked departure from previous types of surveying tenders constructed for the Coast Survey in that a steel hull with complete double bottom and diesel power have been substituted for wood and steam. Such a vessel must combine seagoing qualities, rugged construction, and ease in maneuvering and have ample fuel and fresh water space and comfortable quarters for a complement of from 12 to 15 officers and crew.



Survey tender Westdahl built by Albina Marine Iron Works.

The main engine is an Atlas-Imperial, directly reversible 140-horsepower diesel. The auxiliary equipment consists of two 5-kilowatt Kohler automatic gasoline engine generator sets; and pumps and windlass all motor driven.

The tender is named in honor of Captain Ferdinand Westdahl, who rendered valiant service with the Coast Survey from 1867 until his death in 1919, mostly on the Pacific Coast, Alaska and the Philippines.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of November 1, 1929.

Pacific Coast

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length over-all; 30' beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28; launched 6/17/29; **delivered 11/29.**

Hull No. 113, lightship, sister to above; keel Sept. 1/28; launched 7/2/29; deliver 11/30/29 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

Westdahl, survey tender for the U.S. Coast and Geodetic Survey; 77'6" long; 15'6" beam; 10'3" depth; keel 7/6/29; launched 9/12/29; **delivered 11/21/29.**

One steel barge for Western Transp. Co.; 130 ft. length; keel 10/7/29 est.

BALLARD MARINE RAILWAY COMPANY
Seattle, Washington.

Penquin, hull J-97, patrol boat for U. S. Bureau of Fisheries, Seattle; 130 L.B.P.; 27 beam; Union diesel eng.; deliver January/30.

CRAIG SHIPBUILDING CO.,
Long Beach, Calif.

Purchasing Agent: F. W. Philpot.

Not named, hull 151, yacht for John Barrymore, Los Angeles; 118 L.B.P.; 21 beam; 9 loaded draft; 13 knots speed; 2 275-H.P. Atlas-Imperial diesel engs.; **keel Sept. 15/29**; launch 1/10/30 est.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: A. Wanner.

Itasca, No. 21, diesel-electric cutter for U.S. Coast Guard; 250x42x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.; keel 6/15/29, **launched 11/16/29.**

Sebago, No. 22, same as above; keel 6/15/29.

Saranac, No. 23, same as above.

LAKE WASHINGTON SHIPYARDS,
Houghton, Wn.

Purchasing Agent: A. R. Van Sant.

Foshay, hull 107, steel passenger and freight motorship for Northland Transportation Co., Seattle; 186x35 ft. beam; two 550-H.P. Washington-Estep diesel engs.; keel Mar. 4/29; launched July 27/29; deliver Sept. 15/29 est.

No name, hull 109, cruiser for Stewart Edward White, Hillsborough, Calif.; 75 ft. length; 110 H.P. Washington-Estep diesel eng.; deliver 5/1/30 est.

LOS ANGELES SHIPBUILDING CO.
San Pedro, Calif.

Purchasing Agent: W. E. Wood.

Not named, hull 55, oil barge for Union Oil Co. of Calif.; 3000 bbls. cap.; **keel 10/24/29.**

THE MOORE DRY DOCK CO.
Oakland, Calif.

Hull 179, steel carfloat for Atchison, Topeka & Santa Fe Ry. Co.; 260 L.B.P.; 38 beam; 7'6" draft; 1000 D.W.T.; keel 10/2/29; launch 12/20/29 est.; deliver 1/11/30 est.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

Purchasing Agent: Wm. H. L. Taylor.

C. N. No. 5, hull 31, steel tug for Canadian National Railways; 71'6"x17'x9'6"; 300 B.H.P. diesel eng.; keel 11/30/29 est.

C. N. No. 108, hull 32, steel car barge for Canadian National Railways, 184 x 40 x abt. 5 ft.; cap. 8 loaded cars; **keel 10/30/29.**

Hulls 31 and 32 to be fabricated at yard; then shipped to Kelorona on Okanogan Lake for completion.

Hulls 33 to 36, inc., four wooden scows, 110 x 38 x 9'8"; keels (2) 9/23/29; (2) **10/15/29; 1 launched 10/23/29; 1 launched 10/24/29; 2 delivered 10/26/29.**

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; **deliver Mar. 13/31 est.**

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty-four cargo barges for Inland Waterways Corp., 230x45x11 ft.; **17 delivered.**

Six sand and gravel barges for Rodgers Sand Co., 135 x 27 x 7'6".

One towboat hull for Carnegie Steel Co.; 149 x 34 x 6 ft.

Five standard coal barges for Hillman Transp. Co.; 175x26x11 ft.

BATH IRON WORKS
Bath, Maine

Corsair, hull 124, twin screw steel steam turbo-electric yacht; 343x42x27ft., 18 ft. draft; 6000 S.H.P.; General Electric turbo-generators; Babcock & Wilcox boilers; keel June 11/29; launch Jan. /30 est.

Ebb, hull 126, fishing trawler for Bay State Fishing Co., Boston, Mass., Bath Iron Works design; 132'4" L.O.A.; 121'6" L.W.L.; 24 beam; 13 depth; 500-600 B.H.P. Winton diesel engs.; keel 6/18/29; launch Nov. /30 est.

Flow, hull 127, sister to above; keel 6/18/29; launch No. /30 est.

Malaina, hull 128, steel yacht; B. T. Dobson, designer; owner not named; 168 L.B.P.; 26 beam; 9 draft; twin Winton diesel engs.; 1600 I.H.P.; keel Dec. 5/29 est.

Notre Dame, hull 129, trawler for A. & P. Fish Co., Boston; 116 I.H.P.; 23 beam; 11 loaded draft; single screw; 500 I.H.P. Bessemer diesel eng.; keel 6/18/29; launch Nov. /30 est.

Fordham, hull 130, trawler; sister to above; keel 6/18/29; launch Nov. /30 est.

Goenadier, hull 131, steel aux. schr yacht; Henry J. Gielow, designer; owner not named; 150 L.B.P.; 32 beam; single screw; 300 I.H.P. Bessemer diesel eng.; keel 10/1/29 est.

Althea, hull 132, twin screw diesel yacht for Henry J. Gielow, designer; 105 L.O.A.; 2 200-H.P. Bessemer diesels.

Bidou, hull 133, twin screw diesel yacht; B. T. Dobson, designer; 125 L.O.A.; 2 400-H.P. Winton diesels.

Unnamed, hull 134, steel yacht, owner not named; 190 L.O.A.; 154 L.W.L.; 26 beam; two 800 B.H.P. Bessemer diesels; keel Dec. 15/29 est.

Unnamed, hull 135, same as above; keel Dec. 15/29 est.

Unnamed, hull 136, same as above, keel Dec. 15/29 est.

Unnamed, hull 137, same as above; keel Dec. 15/29 est.

Unnamed, hull 138, same as above; keel Dec. 15/29 est.

Not named, hull 139, diesel yacht, owner not named, 243'9" L.O.A., 227'3" L.W.L.; 36 beam, 21'7" depth, 2 Winton 1100 B.H.P. diesel engs.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Northampton, light cruiser CL-26, for United States Navy; 10,000 tons displacement; launch Sept. 7/29 est.

Berwindvale, Hull 1422, single-screw coal collier for Berwind-White Coal Mine Co. 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers; launched June 8/29.

Not named, hull 1423, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

Hull 1425, steel coasting vessel for Seaboard Shipping Co.; 450 gr. tons; launched May 29/29.

Hull 1426, steel barge for Gulf Refining Co.

Not named, hull 1427, steel trawler for R. O'Brien & Co., Inc., Boston.

Not named, hull 1428, same as above.

Not named, hull 1429, same as above.

Cities Service No. 4, hull 1431, steel barge for Cities Service Ref. Co., New York; 200x36x12 ft.; 12,000 bbls. oil capacity.

Hulls 6139-40, two steel barges for Western Maryland Ry. Co., 499 Gr. T. ea.; **one delivered.**

BETHLEHEM SHIPBUILDING CORP., LTD.,
Baltimore, Md.

Hulls 4252-54, three steel barges for Atlantic Transport Co.; 700 gr. tons each; **one delivered.**

Hull 4255, steel carfloat for Central R.R. of N.J.; 900 gr. tons.

Hulls 4256-4265, 10 steel carfloats for Baltimore & Ohio R.R. Co.; 872 gr. tons each.

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

No. 115, diesel-electric lightship for U. S. Dept. of Commerce, Bureau of Lighthouses, Washington, D.C.; 133'3" L.O.A.; 30' beam; Winton engs.; General Electric generators and motors; keel Jan. 30/29; launched 8/30/29; deliver 12/15/29 est.

No. 116, same as above; keel Feb. 6/29; **launched 10/22/29.**

No. 117, same as above; keel May 1/29; launch Dec. 30/29 est.

One all-welded tanker for stock; launch 12/29 est.

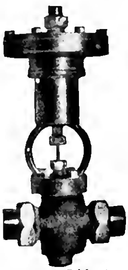
One all-welded tanker.

Not named, steel survey boat for the U.S. Engineers Dept., Philadelphia; keel 12/1/29 est.

COLLINGWOOD SHIPYARDS, Ltd.
Collingwood, Ontario.

Purchasing Agent. E. Podmore.

Roulle, hull 83, tug for Toronto Harbor Comm.; 100 x 25 x 12'6"; 11 loaded speed; T.E. engs. 1000 I.H.P.; Scotch boil-



ers, 195 lbs press.; keel July 25/29. **launched 10/26/29**; deliver 11/7/29 est.

Hull 84, seagoing tug for Canadian Govt., Dept. Pub. Works; 94 L.B.P.; 23'6" beam; 10'6" loaded draft aft; 8'6" loaded draft forward, comp. eng. 500 I.H.P.; 1 Scotch marine boiler 13'9" diam.

Hull 85, sister to above.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2940, 154-ft. cruiser for Anson W. Hard, of New York City; 2 Winton diesel engines.

Hull 2942, 24-ft. coupe yacht tender for above; 1 Chrysler engine.

Hulls 2944, 2945, and 2946, three 30-ft. coupe yacht tenders for yachts now building at Pusey & Jones; 106 H.P. Chrysler engines.

Hulls 2947, 2948, and 2949, three 26-ft open crews' launches for yachts now building at Pusey & Jones; 65 H.P. Chrysler engines.

Hulls 2950 and 2951, two 20-ft. crew's tenders for yachts now building at Pusey & Jones; 12 H.P. Kermath engines.

Hulls 2952, 2953, and 2954, three 24-ft. life boats for yachts now building at Pusey & Jones.

Hull 2957, 75-ft. cruiser for E. F. Clark, Youngstown, Ohio; 2 300-H.P. Speedway engines.

Hull 2960, 135-ft. steel diesel yacht for a prominent New York yachtsman; 2 600 H.P. Treiber diesel engines.

Hull 2961, 75-ft. cruiser for Jeremiah Milbank of New York City; 2 Winton engines.

Hull 2962, 80-ft. cruiser for J. T. McMillan, Detroit, 2 300 H.P. Speedway engines.

Hull 2963, 50-foot cruiser for A. E. Walbridge of New York City; 1 Sterling engine.

Hull 2964, 75-ft. cruiser for G. M. Moffett of New York City; 2 Winton engines.

Hull 2965, 70-ft. commuter boat for D. W. Dilworth of New York City; 2 300-H.P. Speedway engines.

Hull 2966, 80ft. cruiser for G. F. Breen; 2 Winton engs.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W. E. Whitehouse.

Olive K., hull 133, steel yacht for C. F. Kettering, Detroit; **169 L.B.P.; 26 beam;** 12 loaded draft; 15 knots speed; 600 D.W.T.; 1000 I.H.P. diesel engs.; keel Jan. 15/29; launched 9/5/29; **delivered 10/15/29.**

Not named, hull 136, steel yacht for A. V. Davis, New York; 138'6" L.B.P.; 18 beam; 5 loaded draft; 20 M.P.H.; 150 D.W.T.; 1400 I.H.P. diesel engs.; keel July 15/29. launch 2/1/30 est.; deliver Apr. 15/30 est.

Marnell, hull 137, steel yacht for M. H. Alworth, Duluth; 135 L.B.P.; 22 beam; 6'9" draft; 14 M.P.H.; 175 D.W.T.; 600 I.H.P. diesel engs.; keel Apr. 15/29; **launched Oct. 15/29**; deliver Nov. 10/29 est.

Not named, hull 138, steel yacht, owner not named; 153 L.B.P.; 24 beam; 9'6" loaded draft; 15 M.P.H.; 450 D.W.T.; 1000 I.H.P. diesel eng.; keel 11/15/29 est.

Not named, hull 139, steel yacht for Thos. M. Howell, New York City; 160 L.B.P.; 24'6" beam; 8 loaded draft; 17 M.P.H.; 500 D.W.T.; 1300 I.H.P. diesel eng.; keel 11/15/29 est.

Not named, hull 140, wood yacht for R. E. Klages, Columbus, O., 73 L.B.P.; 14'6" beam, 4 loaded draft; 18 M.P.H. speed; 48 D.W.T.; 700 H.P. gas engs.; **keel 10/29/29;** launch 2/1/30 est., deliver 5/1/30 est.

Not named, hull 141, wood yacht for Earl Dawson, Detroit, Mich.; 75 L.B.P.; 14'6" beam; 4 loaded draft; 14 M.P.H. speed; 50 D.W.T.; 300 H.P. diesel engs.; **keel 11/5/29;** launch 2/1/30 est.; deliver 5/1/30 est.

Not named, hull 142, wood yacht for owner not named; 75 L.B.P.; 14'6" beam; 4' draft; 14 M.P.H. speed; 50 D.W.T.; 300 H.P. diesel eng.; keel 11/15/29 est.; launch 2/1/30 est.; deliver 5/1/30 est.

Not named, hull 143, steel yacht for I. Zellerbach, San Francisco; 142 L.B.P.; 24'6" beam; 9' draft; 15 M.P.H. speed; 350 D.W.T.; 800 H.P. diesel engs.; keel 12/1/29 est.; launch 5/15/30 est.; deliver 6/15/30 est.

Not named, hull 144, steel yacht for Geo. W. Loft, New York City; 118 L.B.P.; 18'6" beam; 5'4" loaded draft; 18 M.P.H. speed; 150 D.W.T.; 900 I.H.P. diesel engs.; keel 1/15/30 est.; launch 6/15/30 est.; deliver 7/1/30 est.

DRAVO CONTRACTING COMPANY,
Pittsburg, Pa., and Wilmington, Del.

Hulls 910-913 inc., four steel grain barges for Western Stevedoring Co., 130x30x16'6".

Hull 916, steel hull floating grain elevator for Western Stevedoring Co.

Hulls 826-829 incl., 4 dump scows for Geo. H. Breymann & Bros.; 1500 cu. yd. capacity; **2 delivered.**

Hulls 886-892 incl., 7 steel sand and gravel barges for Arundel Corp.; 130x34x9 ft.; **5 delivered.**

Hulls 917-922 incl., 6 standard sand and gravel barges for stock; 130x30x7'6".

Hulls 923-928 incl., 6 standard sand and gravel barges for stock; 100 x 26 x 8'6".

Hull 929, ladder type sand and gravel dredge for stock.

Hulls 930-949 incl. 20 steel hopper coal barges for Davison Coke and Iron Co.; 175x26x11 ft.; **2 delivered.**

Hulls 960-961, two 200-ft. steel, twin tunnel, steam towboats for Standard Unit Nav. Co.

Hulls 962-963, two 8-car steel carfloats for Reading Co., Philadelphia; 200x34x9 ft.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 111, steel welded barge for O'Brien Bros.; 120 x 36 ft.; 1200 D.W.T.; keel 7/26/29; **launched 10/11/29; delivered 10/19/29.**

Hull 112, barge for Venezuela Gulf Oil Co.; 80 x 24 x 6 ft.; keel 9/11/29; **launched 10/10/29; delivered 10/11/29.**

Not named, hull 113, steam tanker for Standard Shipping Co., New York; 525

L.B.P.; 74 beam; 28'6" loaded draft; 10.5 knots loaded speed; 18,000 D.W.T.; turbine propulsion; H.P. water tube boilers.

Not named, hull 114, sister to above.

Hull 115, welded oil barge for Oil Transfer Corp., New York, 175 long, 36 beam; 1100 D.W.T.

Hull 116, same as above.

Hull 117, oil barge for United Petroleum Transport Co.; 160 long; 28 beam.

GREAT LAKES ENGINEERING WORKS,
River Rouge, Michigan

Not named, hull 274, steamship for Pittsburgh Steamship Co.; 580 L.B.P. 60 beam; 19 loaded draft; 12 mi. speed; 12,000 D.W.T.; T. E. engines, 2250 I.H.P.; 3 Scotch boilers 14' I.D. x 12' long; keel 9/15/29; launch 1/10/30 est.; deliver 4/15/30 est.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1678, track barge for Yourtel Roberts Sand Co., Chester, Ill.; 195x30x6'6"; keel Aug. 20/29; **launched Oct. 23/29.**

Hull 1673, combination cargo and oil barge for Amer. Barge Line Co., Louisville, Ky.; 150x35x11 ft.; keel 5/10/29; launched 9/10/29; **delivered Oct. 5/29.**

Hull 1674, sister to above; keel 6/5/29; launched 9/28/29; **delivered Oct. 18 29.**

Hull 1675, sister to above; keel 9/13/29; launch Nov. 20/29 est.

Hull 1676, sister to above; keel 10/3/29; launch Dec. 5/29 est.

Hull 1678, steam towboat for Vesta Coal Co., Pittsburgh; 139'6" L.B.P.; 34' beam; 7'4½" depth molded; comp. condensing eng.; 1 42" dia. water-tube boiler; Foster-Wheeler Nelis steam generator.

Hull 1679, sister to above.

Not named, hull 1680, steam towboat for Dixie Sand & Gravel Co., Chattanooga, Tenn.; 123 L.B.P.; 28'6" beam; 5'2" depth; straight high pressure steam eng.; 4 fire-tube boilers, 40" x 26'.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

City of Saginaw, hull 246, car ferry for Pere Marquette Rail; Co.; 368 L.B.P. 57 beam; 17 loaded draft; 18 m. speed; 2 turbines: 3600 I.H.P. each; 4 Babcock & Wilcox W.T. boilers; keel Mar. 4/29; launch Aug. 6/29 est.

City of Flint, hull 247, car ferry, sister to above; keel May 1/29.

Reality, hull 248, steel yacht, owner not named; 78 long; 15 beam; 8'9" depth; 6' draft; 150 H.P. Fairbanks - Morse eng.; keel June 12/29; launch Aug. 3/29 est.

Hull 251, derrick barge for T. L. Durocher, Detour, Mich.

Hull 252, same as above.

MIDLAND BARGE COMPANY
Midland, Pa.

One steel hull for New York State Canal Comm.; 106x30x7 ft.; **keel laid.**

Five steel barges for N.Y. State Canal Comm.; 75 x 25 x 5'6"; 4 keels laid; 3 **launched and delivered.**

One hopper barge for Parsons & Rader Transp. Co.; 100 x 24 x 6'6"; **keel laid.**

One mooring barge for Couger-Korsmo Const. Co.; 200x15x4 ft.; **keel laid.**

MIDLAND SHIPBUILDING CO., LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Stadacona, hull 24, bulk freighter for Canada Steamship Lines, Ltd., Montreal; 582 L.B.P.; 60 beam; 20 loaded draft; 11 knots speed; 12,000 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 Scotch boilers; 15'3" dia x 11'6" lg.; keel Apr. 17/29; launched 9/26/29; delivered 11/12/29 est.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, R. L. Baldwin.

Hull 200, towboat, owner not named; 56x14x5'6"; keel July 15/29.

Hulls 201-4 inc., four deck barges for stock; 130x32x8 ft.; keels laid 6/24, 7/1, 7/6, 7/12; launched 7/24, 7/25, 8/6, 8/7.

Hull 205, dry-dock; 48x24x5 ft.

Hulls 206-207, two deck barges; 120x30x7 ft.

Hulls 208-209, two deck barges; 100x24x5 ft.

Hull 210, dredge; 134'6"x30x8 ft.

Hulls 211-212, two deck barges; 130x32x8 ft.

Hull 213, dredge; 150x36x6 ft.

Hull 214, dry-dock; 48x24x5 ft.

Hulls 215-220 incl., six deck barges; 133x29x7½ ft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; launched Sept. 7/29; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Pennsylvania, hull 329, 18 - knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Oct. 15/28; launched July 10/29, **delivered 10/10/29.**

Morro Castle, hull 337, passenger liner for A.G.W.I. Nav. Co., New York; 508 x 70'9" x 39'; 15,380 tons displ.; 16,000 S.H.P.; 20 knots speed; turbo-elec. drive; keel July 23/29.

Not named, hull 338, sister to above;

keel July 8/29.

Not named. hull 339. passenger and freight liner for Dollar Steamship Co.. San Francisco; 653 L.O.A.; 81 beam. 52 depth: turbo-electric drive: 20 knots speed: deliver Oct 31 est.

Not named. hull 340. sister to above: deliver 2 32 est

NEW YORK SHIPBUILDING CO.
Camden, N. J.

Purchasing Agent: J. W. Meeker.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; launched Jan. 23/29; deliver July 9/29 est.

Chester, light cruiser CL- 27 for United States Navy. 10.000 tons displacement: keel Mar 7/28; launched 7/3/29; deliver June 13/30 est.

Santa Clara, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'9" beam; 37'5" depth; General Electric turbo-electric machinery; keel Feb. 4/29; launch Nov./29 est.; deliver Apr./30 est.

Hull 393, carfloat for Erie R.R.; 366 x 38 x10'5"; keel June 26/29. launch 10/10/29 est.; deliver 10/21/29 est.

Not named. hull 394. passenger and cargo steamers for Export Steamship Corp., New York: 450x61'6"x42'3": keel 12 1/29 est.

Not named. hull 395, sister to above; keel 12/1/29 est.

Not named. hull 396. sister to above; keel 10/1/30 est

Not named, hull 397. sister to above; keel 11/1/30 est

Not named. hull 399. light cruiser No. 35 for United States Navy; 10,000 tons displacement.

Hull 400. barge for Hercules Cement Corp.; 200x37x9'6"; keel 11/29 est.; launch and deliver 2/1/30 est.

THE PUSEY & JONES CORP.,
Wilmington, Del.

Purchasing Agent: James Bradford.

Nakhoda. hull 1040, yacht for Fred J. Fisher. Detroit; 236 L.O.A.; 34 beam; 19 depth: 12'6" draft; 2 1100 H.P diesel engs.; keel Feb. 12/29; launched 8/20/29; deliver 11/15/29 est.

Rene. hull 1041, yacht for Alfred P. Sloan. Jr., New York; same as above; keel Feb 12 29. launched 9/19/29. deliver 12/1/29 est.

Cambriona, hull 1042, yacht for owner not named: same as above: keel Mar. 12/29; launched 10 7 29: deliver 12/29 est

Lotusland. hull 1043, twin screw diesel yacht, ordered by Cox & Stevens, Inc., New York: 168'9" long. 28' beam: two 500-B.H.P. diesel eng., keel June 13/29, launch 10 15 29 est

Not named, hull 1044. oil tanker for Tide Water Oil Co.; 255 L.B.P.; 44 beam; 15'6" loaded draft; 1250 I.H.P. diesel-electric propulsion; **keel Oct. 19 29.**

Not named, hull 1045. twin screw diesel yacht for R. R. M. Carpenter, Wilmington, Del.; 130 L.O.A.; 21 beam; 6 loaded draft; 2 Winton 400-H.P. diesels.

THE SPEAR ENGINEERS, INC.,
Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor. keel Aug. 18/28.

City of Norfolk, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General-Electric propelling motor of 650 H.P., keel Feb. 1/29; launch July 30/29 est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Argos, hull 265, steel hull, steam driven, patrol vessel for Supervisors of New York Harbor. 39 Whitehall Street, New York; 114 L.B.P.; 121'5½" L.O.A.; 24 molded beam; 10'1½" mean draft; T. E. engs.; Babcock & Wilcox W.T. boilers; keel Apr 6/29; launched 9/5/29; deliver 12/10/20/29 est.

Not named, hull 266, steel hull freight and passenger tug for U. S. Dept. of Public Health, Boston; 91 L.O.A.; 20 molded beam; 9 draft; 350 H.P. Standard diesel eng.; keel 10/15/29 est.

Not named, hull 267, steel hull diesel tugboat for Oil Transfer Co., 17 Battery Place, New York; 95 L.O.A.; 22 beam; 10'6" loaded draft; eng. not decided; keel 11/10/29 est.

Not named, hull 268, steel hull diesel tugboat for Atlantic, Gulf & Pacific Co., New York; 57 L.O.A.; 14'4" beam; 5'6" loaded draft; 120 H.P. Fairbanks-Morse diesel eng.; keel 11 10/29 est

SUN SHIPBUILDING COMPANY,
Chester, Penn.

Purchasing Agent: H. W. Scott.

City of New York, hull 116, passenger and freight motorship for American South African Line, Inc., New York: 450 L.B.P.; 61'6" beam; 26' loaded draft; 13 knots speed; 9350 D.W.T.; Sun-Doxford diesel engs., keel Mar 14/29; launched 10/19/29; deliver Nov. 15/29 est.

Not named, hull 120, single-screw, diesel tanker for Motor Tankship Corp.; 13,400 D.W.T. keel 6/5/29; launch 11/30/29 est.; deliver 11/30/29 est.

No name, hull 122, sister to above; keel 9 12/29; launch 2/1/30 est.

Not named, hull 123, sister to above.

Not named, hull 124, sister to above.

Not named, hull 125, single screw, steel, diesel-electric tanker for Tide Water-Associated Transport. Corp., New York; 13,450 D.W.T.

Not named, hull 126, sister to above.

Not named. hull 127. single screw diesel oil tanker for Standard Transp. Co.; 480 x 65'9" x 37'; keel 4/1/30 est.; launch 10/15/30 est.

Not named, hull 128, sister to above; keel 5/1/30 est.; launch 11/15/30 est.

TOLEDO SHIPBUILDING CO.,
Toledo, Ohio.

Purchasing Agent. Otto Hall.

Not named, hull 182, fire boat for City of Detroit; 125 L.B.P.; 29 beam; 10 loaded draft; 14 mi. speed; comp. engs.; 950 I.H.P.; 2 B. & W. boilers; deliver Aug./29 est.

Not named, hull 183, steel ferry for Wabash Rly. Co.

UNITED DRY DOCKS, Inc.
Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Socony 23, hull 790, tug for Standard Transp. Co., New York; 91'6"x22'x10'9"; 12 loaded speed; comp. eng. 500 I.H.P.. 1 Scotch boiler; 12'6"x11'; keel June 29/29; launched 9/19/29; **delivered 10/30/29.**

Socony 27, hull 791, tug, sister to above; keel June 29/29; **launched 10/10/29;** deliver 11/12/29 est.

Not named, hull 792, tug for Henry Dubois Sons Co.; 128 L.O.A.; 27 beam; 14 depth; 12 mi. speed; TE engs. 800 I.H.P.; 1 Scotch boiler 16'x11'6".

Not named, hull 793, tug for Baltimore & Ohio R.R. Co. 118'6" L.O.A.; 25 beam; 13'6" depth; 12 miles loaded speed; comp. steam eng.; 850 I.H.P.; 1 Scotch boiler 15 x 12 ft.

Not named, hull 794, sister to above.

Not named, hull 795, ferryboat for City of New York, 267 L.O.A.; 66 beam; 13'9" loaded draft; 12 knots speed; dbl. comp. eng. 4000 I.H.P.; 4 W.T. boilers; keel 12/15/29 est.; deliver 10/30 est.

Not named, hull 796, lighter for New York Central R.R. Co.; 122 x 32'6"; 540 I.H.P. diesel eng.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Not named, hull 82, single screw steel diesel tug for U.S. Engineers Office, Wilmington, N.C.; 65'6" x 17' x 7'7½"; **keel Oct. 29/29.**

Not named, hull 83, turbo-electric, twin-screw, tunnel towboat for Mississippi Valley Barge Line Co., St. Louis; 200x40x10'6".

Not named, hull 84, sister above.

Repairs

CHARLESTON DRYDOCK & MACHINERY CO.,
Charleston, S.C.

General repairs: s.s. Fluor Spar. Scraped and painted: s.s. Cibao. Overhauled: snagboat Wateree.

CRAIG SHIPBUILDING CO.,
Long Beach, Calif.

General voyage repairs: tanker Keekoskee. Blowdown, new deck: tanker Topilla. Drydock: Union Oil fuel barge, Richfield fuel oil barge. Install $C.O._2$ system: yacht Malibu. Engine repairs: yacht Hilda.

Who Did What ...and How

[illegible] Shell [illegible] Marine [illegible]

[illegible] Chief Engineer [illegible] R. W. [illegible]

[illegible] Shell [illegible] lubrication of this vessel. The [illegible] that courtesy and service [illegible] Shell installation [illegible]

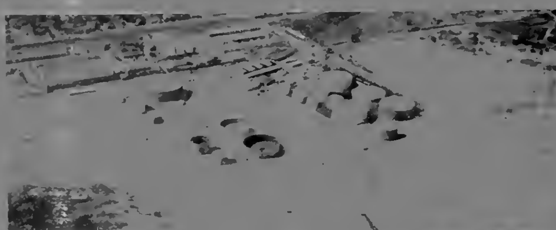
[illegible] four other vessels [illegible] service to the Orient [illegible] the Tyndareus [illegible] Shell Marine Lubricants exclusively.

The Motorship "Wilmoto," pictured here, is owned by the [illegible] Steamship [illegible] New York. The "Wilmoto" is powered [illegible] Burmeister & Wain [illegible] of 2300 [illegible] Chief Engineer J. A. H[illegible] [illegible]

[illegible] performance [illegible]

The "Wilmoto" [illegible] motor vessels, uses Shell [illegible] Lubricating [illegible] satisfaction [illegible] Engine and [illegible] ing Departments. A [illegible] was taken on board [illegible] Pedro.

hell at ortland, regon



Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

James King Steele, publicity director for the Nippon Yusen Kaisha, is receiving many congratulations on the manner in which he handled the various functions heralding the advent of the new motor liner Asama Maru in transpacific service and on the very unique and effective publicity material that he initiated for the use of the passenger department in selling accommodations on that vessel.

In place of the usual passenger accommodation plan folder, Steele brought out an airplane view of the vessel arranged in a folder so that the picture of the ship opens along the waterline. The raising of the upper leaf with the boat deck discloses a view in perspective of all the public rooms and promenades on A deck. Raising this leaf discloses B Deck, and so on. The E Deck level opens in the opposite direction, disclosing complete orthodox passenger accommodation deck arrangement plans for the whole ship.

This pamphlet is a very original and pleasing bit of printcraft, and we are sure it will prove a very efficient salesman for the many delightful features of sea travel offered by this ship and this line.

Edward T. Ford, vice-president of W. R. Grace & Co. in charge of Pacific Coast affairs, and president of the Panama Mail Steamship Company of San Francisco, recently returned home after a visit of several weeks in New York and Washington, where he worked with President Hoover's committee on mail contracts and shipbuilding loan funds, and the company is in hopes of receiving some mail contracts in the near future.

On his return to San Francisco, Mr. Ford announced several important changes in executive positions.

Daulton Mann has been appointed vice-president of the Panama Mail Steamship Company and executive vice-president of the Grace Lines, Inc., with headquarters in New York. Daulton Mann is one of the youngest shipping executives in the United States. He was born and reared in San Francisco and joined the staff of W. R. Grace & Co., as junior clerk in 1912. He was assistant manager of the old Pacific Mail Steamship Company, and when the Panama Mail Steamship Company was formed in 1925 he was appointed general manager.

Chief Engineer T. Hamano who presides over the machinery plant of the new motor liner Asama Maru.

C. C. Mallory, formerly assistant to the manager of the Panama Mail Steamship Company, has been promoted to the position of general manager of the company with headquarters in San Francisco. Mr. Mallory joined the old Pacific Mail Steamship Company in 1921 after having been with the Shipping Board.

A. Brodlinger, guarantee engineer on the Asama Maru for Sulzer Bros. of Winterthur, Switzerland.

Both appointments became effective December 1.

Another appointment of importance, announced by Daulton Mann, is that of Captain **Andreas C. Paulsen**, well known Pacific Coast master, to the position of port captain of the Panama Mail line and the Grace Lines, Inc., in New York. Captain Paulsen was formerly master of the intercoastal liners Guatemala and Colombia.

Captain **John Percival** is now in command of the Guatemala, relieving Captain Paulsen.

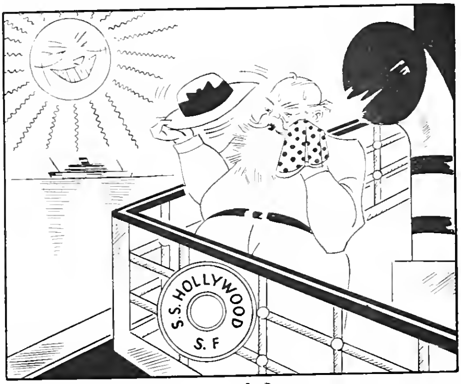
A San Francisco shipping leader and business pioneer passed away in London on November 8, with the death of **Sir Robert Balfour**, one of the founders of Balfour, Guthrie & Co.

Robert Balfour was 85 years old at the time of his death. News of his passing was received in San Francisco by G. H. G. Williamson. Sir Robert is survived by his widow, Lady Balfour.

Sir Robert was a familiar figure on the floor of the Merchants Exchange every time he visited San Francisco from his home in London, which was frequently. Sir Robert had retired in 1926, but he kept in close contact with his various activities.

In 1869, Balfour founded in San Francisco the shipping firm which bears his name. He was a resident of San Francisco from 1869 until 1893, when he returned to England to make his residence. He was a charter member of the Pacific Union Club.

Joseph Fitzgerald, well-known in Pacific Coast marine engineering circles, is now chief engineer aboard the Panama Mail liner Guatemala. He succeeded **William W. Stirling**, who has been ordered shoreside awaiting another appointment.


S. S. HOLLYWOOD
S. F

F. C. Patterson, formerly with the North Bank dock at Portland, has been named commercial agent for the Portland organization of the Nelson Line.

J. S. Byrom has been named successor to **W. H. Rowlands**, who retired as port steward of the British Columbia Coast Service of the Canadian Pacific Railway.

Rowlands started his sea experience in 1877 in the steward's department of the White Star Line. He came to Canada in 1907, and joined the service of the C.P.R. on this coast. He has been port steward of the British Columbia services of the C.P.R. since 1911, and is known to thousands of seafaring men and travelers.

It was erroneously reported in these columns of the November issue that **E. C. C. Wellesley**, San Francisco district freight agent for the **Nelson Steamship Company**, had severed connections with the company.

Mr. Wellesley is still actively identified with the Nelson Company, and Pacific Marine Review extends its apologies for publishing his retirement.

Vancouver, British Columbia, advices report that compulsory pooling of pilotage dues, pensions, and collection of pilotage dues through the pilotage superintendent alone are now law on the British Columbia coast with the exception of the Fraser River.

All the pilotage business of the British Columbia pilots with the exception of Fraser River will in future be handled through **Captain F. T. Saunders**, superintendent of pilotage at Vancouver, or through his assistants at Victoria or Prince Rupert.

Announcement was also made that **W. J. Anderson**, formerly with the Federal Pilots of British Columbia, had been appointed assistant to Captain Saunders.

The sum of $25,000 has been appropriated by the government to improve the floating equipment of the British Columbia pilots, this expenditure to be repaid by the pilots over a period of 10 years, the advices stated.

The former Shipping Board freighter **Oriole**, now owned by the States Steamship Company of Portland has been renamed the **San Bernardino**. The name of the **Myrtle** of

Edward H. Maggard, vice-president and general manager of the Southern Pacific-Golden Gate Ferries, Ltd.

the Quaker Line fleet has been changed to the **San Marcos**.

New York advices state that the United States Lines will transfer its German terminus from Bremen to Hamburg on December 12. In charge of the terminus is **Captain Thomas Blau**, well known in Pacific Shipping circles, who was formerly in command of transpacific and intercoastal passenger liners for the old Pacific Mail Steamship Company.

One of the most popular maritime executives on the Pacific Coast is

E. Grant McMicken, long and favorably known as passenger traffic manager of the Pacific Steamship Company, has recently resigned to assume a new position as vice-president and general passenger traffic manager of the United States Lines at New York.

Edward H. Maggard, who, on May 1, 1929, was elected vice-president and general manager of the Southern Pacific-Golden Gate Ferries, Ltd., when the company was organized.

Mr. Maggard's quiet executiveness, coupled with his keen understanding, has endeared him to all employees. One of Mr. Maggard's first acts after assuming his position was the institution of annual transportation for themselves and families of all employes who have been five years or more with this company and its predecessors. The privilege is granted to all those who were either employed by the Southern Pacific Company, the Northwestern Pacific Railroad Company, or the Monticello Steamship Company.

Guy E. Buck, freight traffic manager of the Panama Mail Steamship Company, is expected to return the middle of this month from a sixty-day trip to Mexico and parts of Central America.

Harry Perkins, formerly in charge of the Los Angeles offices of the United States Lines, is now connected with the passenger department of the Panama Mail Steamship Company in a traveling capacity.

S. P. Trood, advertising manager for the Los Angeles Steamship Company, has returned home from a tour to Hawaii.

The **Longshoremen of Los Angeles Harbor** boast the only football team of pier workers in the United States. They play the regulation college game, have uniforms, and practice one day each week. They have defeated the best teams put forth by the United States Pacific Fleet, and their prowess has been such that they draw attendances from 15,000 to 20,000 at each game.

Announcement was made by Captain **Stanley E. Allen**, secretary, that the Board of Directors of the **Propeller Club of San Francisco** have decided to increase the initiation fee, commencing the first of the year. At present the fee is ten dollars.

The Propeller Club, a little more than six months in existence, is the largest maritime organization in the West, boasting more than 450 members connected with maritime activities afloat and ashore. It is the aim of the organization to secure a

clubhouse during 1930. On Saturday night, December 14, the Propeller Club will stage a banquet and entertainment in the Hotel Whitcomb, the last fete of 1929. Those in charge of reservations are: **Fred Cordes**, of Cordes Brothers, chairman; **Thomas Foster**, Bethlehem Shipbuilding Corporation; and **Joseph Hollings**, Charles Nelson Company.

Dinner committee: **John Dodds**, General Electric Company, chairman; **Fletcher Munson**, General Engineering and Drydock Company; **Jack O'Hare**, Marine Electric Company; and **Kenneth Ingraham**, Standard Oil Company.

Decorations committee: **J. F. McConkey**, Sperry Gyroscope Company, chairman; **Jerome Lalor**, Charles Cory & Son, Inc.; and **Harold Bolton**, Standard Oil Co.

Entertainment committee: **Karl Eber**, chairman; **Oroville Davis** and **Herbert (Bert) Anderson.**

Organization of a Glee Club, composed of members of the Propeller Club is now under way under the direction of **Carl Lane** of C. V. Lane, Inc., as chairman; **Tom Short**, marine superintendent of the Alaska Packers Association; and **Jutian Thiealle**, of the Robert Dollar Company.

On the night of the banquet, **Ralph Myers**, of Hobbs, Wall Company, will present a silver cup from the Propeller Club to the winning team of Sea Scouts from five San Francisco High Schools participating in a series of rowing races on San Francisco Bay.

Joseph A. Lunny, operating manager for the McCormick Steamship Company, is expected back from Philadelphia, where he supervised the reconditioning of the freighter Western Ally, purchased by the company for the Munson-McCormick intercoastal service from the Shipping Board for the reported price of $171,100.

Captain Hans Lofstadt, well-known Pacific Coast navigator and Columbia River pilot, could not be landed aboard the pilot boat from the steamer Haver at the mouth of the river because of bad weather and was forced to continue on to San Francisco.

However, as soon as the Haver arrived in the Golden Gate, Captain Lofstad boarded an airplane and flew back to Portland. Now Columbia River pilots, whenever they are forced to continue on to another Pacific Coast port, will utilize airplane transportation for the return to their berths.

Eskil Berg, consulting engineer for the General Electric Company, is here shown balancing a nickel on the head of one of the main bearing cap screws of the propulsion motors of the steamship Pennsylvania to prove the absence of vibration.

George F. Nicholson, Los Angeles Harbor engineer, is now in Washington representing the Harbor Commission, before the hearing conducted by the board of Army Engineers on the proposed extension of the Los Angeles breakwater.

The hearing opened on November 26 and is to determine whether the federal government should withdraw its allocation of $7,000,000 for the construction of the proposed breakwater extension due to the failure of the cities of Long Beach and Los Angeles to carry out the provisions attached to the expenditure of the money. The provisions included the formation of a port district and the unification of the two ports and the building of a belt line railroad.

Captain John Percival, who has recently returned as master of the Panama Mail liner Guatemala after an absence of nine months on the Atlantic Coast.

Death ended a long career in Pacific Coast shipping with the passing of Captain **Emery Lewis McNoble**, who, until his passing, was for sixteen years port captain of the Admiral Line. Funeral services for Captain McNoble were held on November 9 in San Francisco.

E. Grant McMicken, on December 1, assumed the position of vice-president and general passenger traffic manager of the United States Lines, with headquarters in New York.

McMicken is one of the best known steamship passenger men in the United States. His resignation tendered to **H. F. Alexander**, head of the Admiral Line, as passenger traffic manager of the Pacific Steamship Company, was a surprise in Pacific Coast shipping.

McMicken had been with the Admiral Line since 1916, and since he became identified with the company he had played an active part in post-war passenger development on the West Coast.

McMicken's headquarters will be in the general executive offices of the United States Lines, 45 Broadway, New York.

William P. Roth, president, appointed **John E. Ryan** as general passenger traffic manager of the Matson Navigation Company. The announcement came as a surprise in the shipping world.

In making the announcement Mr. Roth stated that **William H. Sellander**, veteran of the Matson organization, remains as passenger traffic manager, and **Herbert N. Thomas** continues as general passenger agent.

Fred E. Doelker, operating and traffic manager of W. R. Grace & Company, San Francisco, is the new chairman for the Pacific-West Coast South America Conference. Doelker is recognized as one of the best authorities on South American trade conditions in the United States.

NORTH PACIFIC COAST LINE

JOINT SERVICE OF

Holland-America Line , , Royal Mail Steam Packet Company

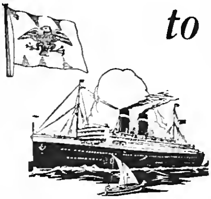
Between PACIFIC COAST PORTS AND UNITED KINGDOM AND CONTINENTAL PORTS

ALL VESSELS ARE ESPECIALLY FITTED WITH REFRIGERATOR SPACE FOR CARRYING PERISHABLES

The Pioneer Refrigerator Service

120 Market Street HOLLAND-AMERICA LINE San Francisco

Fastest Passenger and Freight Service



to New York

WITH DIRECT CONNECTIONS FOR EUROPE

Sailing Every other Saturday from San Francisco
Every other Monday from Los Angeles

PASSENGER OFFICES:
460 Market St. ....San Francisco
715 West Seventh St.........Los Angeles
1333 Fourth Ave.........Seattle

FREIGHT OFFICES:
Pacific Steamship Company.
311 California St. ......San Francisco
Pacific S.S. Co.'s Terminal.......Seattle
204 Central Bldg. ....Los Angeles

Panama Pacific Line

INTERNATIONAL MERCANTILE MARINE CO.

ISTHMIAN STEAMSHIP LINES

PACIFIC-UNITED KINGDOM SERVICE

FROM PACIFIC COAST PORTS TO LONDON, LIVERPOOL, AVONMOUTH, also GLASGOW, BELFAST, DUBLIN

For Rates and Particulars Apply to

E. C. EVANS & SONS, Inc.

General Agents Pacific Coast

260 California Street, San Francisco Phone—Douglas 8040-8041-8042

B. W. GREER & SON, LTD., Agents, Vancouver

NORTON, LILLY & COMPANY, Agents, Portland, Seattle, Los Angeles and San Diego

FURNESS LINE

"THE UP-TO-DATE REFRIGERATOR SERVICE."

Express, Freight and Passenger Service

Pacific Coast Ports *to* United Kingdom

FURNESS [Pacific], Ltd.

Pacific Coast Agents

VANCOUVER SEATTLE PORTLAND
SAN FRANCISCO LOS ANGELES

Hamburg-American Line Motorship Oakland

(Continued from Page 495)

is, we believe, the first marine installation of this type. Injection on these engines is of the Hessleman patent type. The fuel pump builds up a pressure of 4000 pounds per square inch and the automatic fuel valve opens at this pressure, injecting the oil through a nozzle with very small orifices, resulting in very fine atomization. In the upper cylinder heads there are but two openings, one for the fuel valve centrally located and one for a relief or safety valve. Fuel injection valves for the lower half of the cylinder are installed on the engine frame, and each valve is connected by tubing to four small nozzle tips set in the cylinder head tangentially on a circle a little larger than half the cylinder diameter. The oil spray is thus directed slightly toward the cylinder wall and away from the piston rod.

The control stand is located on the lower platform, and the operations of starting, reversing and all speed control are handled very simply and speedily with one handwheel. The fuel pump is located at the control stand; and any pump can be cut out at will by the engineer in charge. 350 pounds of air are used in starting.

Scavenging air is supplied by an electrically driven blower. All cooling is by fresh water in a closed system. Before going to the three-stage salt water cooled heat transfer coils, this fresh water is passed from the engine through the Deutsche Werft patent Turbalo water and oil separator, and then through a filter so as to allow for cleaning. The bilge pump discharge is also taken through a large capacity Turbalo bilge water cleaner so as to conform to the many ordinances of various harbor authorities forbidding oil contamination of harbor waters.

The design of this engine throughout and the layout of the engine room show careful consideration for marine problems and for reliable operation at sea. This resulted in a non-stop, no trouble run of five weeks from Hamburg to San Francisco; and we think it safe to predict that there will be no stopping for trouble on the Oakland during many round voyages.

The steering mechanism is electrically operated by the A.E.G. system of Leonard control. The rudder is the Deutsche Werft patent Simplex balanced rudder, said to be the best all around steering device so far developed. The testimony of the ship's officers is that with this combination all steering problems are practically solved with a minimum expenditure of power. So well is this rudder balanced that one man can handle it easily through the hand gear, and the ordinary expenditure of energy though the electrical control is less than one horsepower.

The next two of the seven vessels for this Hamburg-American Line service will be the Tacoma and the Vancouver. They will be of similar type, but with geared turbine machinery using two sets of turbines taken from Hamburg-American Line transatlantic steamers that are being given greater power and speed. With the seven vessels on the run, a fortnightly service will be maintained regularly. This should start in the early summer of 1930.

The New Lightship

(Continued from Page 516)

step compressors driven by General Electric motors. A Worthington Model 99 pump takes care of fuel oil transfer. The fresh water pump, fire and bilge pump, and the condensate pump for the steam heating boiler are all of Worthington make driven by General Electric motors.

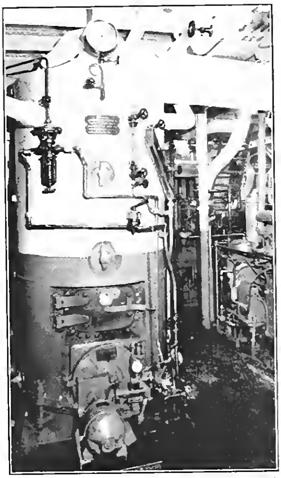
Heat for crew quarters and all of the living spaces on the ship is provided by a heavy steel, upright, tubular boiler built by the Albina Marine Iron Works and fitted with a Ray rotary automatic oil burner.

The galley range is also an oil burner. It is the well known Webb ship range fitted with Valjean burner.

A large Hyde, double reduction spur gear, electric windlass forward takes care of the heavy mooring chain and anchor. 300 fathoms of 2-inch Naco, stud-link, cast steel anchor chain are carried, with a 7000-pound mushroom type anchor in the center hawse pipe for sea duty, and a 5000-pound mushroom type spare anchor at the side hawse hole. The windlass is set on a slight bias so as to get as straight a pull as possible on the chains through both of these hawse holes.

The hull is of unusually heavy construction and is divided into six water-tight compartments by five water-tight bulkheads. Provision is made in the hull for carrying nearly five tons of lubricating oil, 59 tons of fuel oil, and 39 tons of fresh water.

Excellent roomy, well ventilated accommodations are provided for a crew of seventeen. Ten men in accommodations forward include six seamen, three oilers, and the cook. Officers accommodations aft provide for a master, two mates, three engineers, and a radio operator. Liberal provision is made for the shower baths and lavatories throughout the quarters. Special spring bunks insure sleeping comfort. A large, double compartment, Frigidaire automatic refrigerating unit insures the proper care of provisions between contacts with the lighthouse tender. And it would appear as, so far as human ingenuity can contrive, the life of the crew of the Blunts Reef lightship will be fairly comfortable.



The donkey boiler on the new lightship is fitted with a Ray rotary fuel oil burner.

Organization and Trade Notes

New Firm of Naval Architects

ANNOUNCEMENT of the partnership of William Lambie and Curtis D. Mabry, naval architects and marine engineers and marine surveyors at Wilmington, California, has recently been made. The new firm, to be known as Lambie & Mabry, has offices in the Security First National Bank Building at 106 East C Street, Wilmington, California. Both partners are well known in the Pacific Coast marine circles.

William Lambie, a native of Scotland, began his marine career in 1902 in the drawing office of John Brown Co., Ltd., of Clydebank, Scotland, and for four years was assistant in the firm's model basin engaged on design of ship's lines, propellers, and propulsion problems generally. Owing to the fact that there are few private model basins in existence this experience is necessarily limited to a few naval architects.

Since coming to America in 1912 he joined the drawing office staff of the Fore River Shipbuilding Co. in Quincy, Massachusetts, and later was employed by Bath Iron Works, Bath, Maine, Ames Shipbuilding Company, Seattle, and finally by the Southwestern Shipbuilding Company in San Pedro, California, being with this latter company as naval architect during its existence, where he was responsible for the design of all the vessels built by them.

Opening his own office in Wilmington about five years ago, he was quick to recognize that there was a good field for the naval architect in the design of propellers, in which field he has gained an enviable reputation. Lambie's propellers have improved the speed of many vessels, probably the best known being the case of the Los Angeles Steamship Company's steamers City of Los Angeles, Harvard, and Yale, the running time of the latter vessels being reduced by more than one hour from San Pedro to San Francisco.

Curtis D. Mabry is a graduate of Webb Institute of Naval Architects and Marine Engineering of New York. Upon graduation he entered the office of William Gardner, one of the foremost of American naval architects, and was associated with Mr. Gardner for over eleven years, where he received his training in the design of sailing yachts, both racing and cruising, the larger steam and power yachts, and passenger steamers.

After leaving New York, the design of submarines at the Electric Boat Company and destroyers at the Bath Iron Works occupied the time until the war began, at which time he came first to the Pacific Coast, being chief draftsman at the J. F. Duthie yard in Seattle until the war's close. Mr. Mabry then returned east and was in charge of the design of four municipal ferry boats for New York City.

Mr. Mabry returned in 1920 to San Pedro to join Mr. Lambie at the Southwestern Shipbuilding Company as chief in charge of the drawing room, and so continued until the yard closed.

Mr. Mabry until returning west this fall has been associated with John G. Alden of Boston, in charge of the design and supervision of all of the larger construction work in both yachts and commercial vessels. The partnership of Messrs. Lambie and Mabry is the culmination of a friendship and business association of fourteen years.

Package Research

PACKAGE Research Laboratory at Rockaway, New Jersey, announces the appointment of Ira B. Lanphier, of Madison, Wisconsin, as director.

In his new capacity, Mr. Lanphier will continue the work of package design and construction that he has been carrying on for several years under John A. Newlin at the Forest Products Laboratory. His new work and that of Package Research Laboratory will be directed toward cutting container and transportation costs in the shipment of all clases of goods which require boxes or crates for safe transit.

One of his important tasks will be the further development of wirebound boxes, which are growing in popularity because of their light weight, strength, and low cost.

In these boxes, steel wire and staples are substituted for a large part of the wood formerly used, with an average saving of $62\frac{1}{2}$ per cent of the weight of wood. This results in the conservation of large quantities of wood, as well as the production of containers of greater flexibility, lighter weight, and equal or greater strength.

Mr. Lanphier is a graduate of South Dakota State College and has the degree of Civil Engineer from the University of Wisconsin. He served in the Field Artillery of the 91st Division during the war as second and first lieutenant, and is now major in the Field Artillery Reserve.

The past $8\frac{1}{2}$ years Mr. Lanphier has devoted to the study of the properties of wood and the design and construction of containers of all types at the Forest Products Laboratory at Madison, which is a part of the Branch of Research of the Forest Service, United States Department of Agriculture.

ENGLISH CONCERN HELPS "OLD IRONSIDES"

NOT many months hence the U.S.S. Constitution will be spreading her wings proudly to the breezes. Such a small amount of funds is now needed to finish the work of overhauling and reconstruction that no one doubts for an instant the success of this patriotic endeavor, started with the pennies of thousands of school children. All that is necessary is for the public to know that a little more cash is wanted and it will be forthcoming immediately.

L. W. Ferdinand & Co., of Boston, United States representative of Jeffery's Marine Glues has donated half of the marine glue necessary to put the old frigate in commission again. The English concern of Jeffery's Marine Glues have most generously volunteered to supply free of charge the other half. This is extremely liberal on the part of the donators, as it will take all of 5000 pounds, or two and one-half tons of glue to do a thorough job.

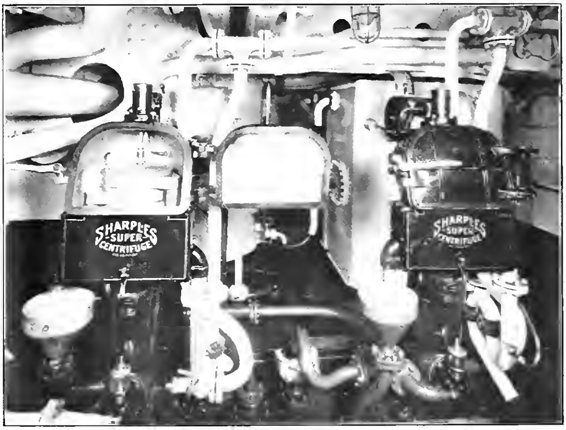
Machinery Installation on the Asama Maru

(Continued from Page 493)

tors on the way to the daily service tanks. A battery of three No. 900 De Laval vapor-tight, fuel oil centrifugals does this work very effectively and has sufficient capacity to take care of the normal fuel consumption with one idle or being cleaned. Two National liquid meters check the oil consumption; and a battery of Pneumercator gauges indicates the tank contents.

The cargo handling machinery consists of twelve 5-ton and four 3-ton Laurence-Scott electric, worm drive winches. The windlass is driven by a 140-horsepower motor, and quite a number of electric capstans and warping winches are in evidence.

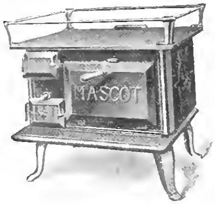
Lifeboat and life raft space is provided for full capacity of passengers and crew. The forward boat, port and starboard, is equipped with gasoline engine drive and with radio. Several boats on each side are equipped with the new manual propeller gear in place of oars. All boats are handled on Welin or Welin-McLaughlin davits by electric boat hoists.



This pair of Sharples super-centrifuge oil purifiers takes care of the lubricating oil for the main engines. A similar installation guards the lubrication of the auxiliary engine.

The bridge of the Asama Maru is a central control room for the entire ship. Mechanical engine room telegraphs are duplicated in case of emergency by an ingenious electrical signaling device employing colored lights. A Kolster radio direction finder mounted over a Sperry gyro-compass repeater insures safe navigation in fog. The Sperry gyro-helmsman and the Sperry course recorder keep the vessel on a predetermined course with minimum yaw. Several Kent Clear-Vision screens help the navigating officer to see clearly in rain, snow, sleet, hail, or mist. Stone electric watertight doors in bulkheads in various parts of the ship's under-water body are opened or closed at will from the bridge through the Stone control board. Fire in any of the holds or machinery spaces immediately registers in the Rich smoke detection cabinet; or, if the fire be in passenger spaces, the Derby fire-alarm system indicates the spot. A Sal-log indicates and registers the speed of the ship through water and a Walker electric ship's log checks both speed and distance. A

The pilot house of the Asama Maru is the central control station for all power activities and ship's navigation.



MASCOT Ship Stoves

H. A. B. SNEVE CO.

SEATTLE—SAN FRANCISCO—NEW ORLEANS
62 Marion St. 38 Spear St. P. O. Box 1234

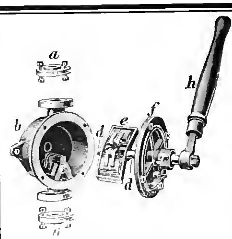
MANUFACTURERS' REPRESENTATIVES

IMPORTERS and EXPORTERS

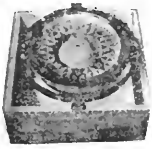
FACTORY AGENTS MARINE SUPPLIES

SELLING TO DISTRIBUTORS

Representing the following Manufacturers:



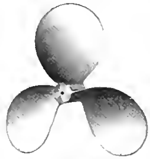
WING Pumps



STAR
Spirit Compasses

ISAACSON IRON WORKS
Kedge and Dory Anchors—Forgings. Navy and Babbitt Anchors, Steel Castings.

ALBERT WINSLOW CO.
Northern Ash Oars, Canoe Paddles



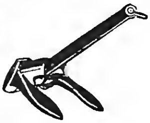
COLUMBIAN
Propellers

Wm. S. Brusstar, Jr.
Balsa Preservers, Buoys, Kapoc Jackets

A. E. Moeller Company
Barometers, Thermometers Hydrometers

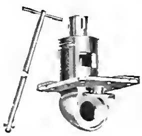
ST. CLAIR IRON WORKS
Automatic Boat Bailers

Zophar Mills, Inc.
Ship Pitch, Turps, Naval Stores



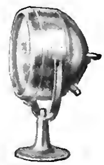
Lobee Pump & Machinery Co.
Brass Gear Pumps

MAINE STEEL PRODUCTS CO.
Marine Hardware, Drop Forgings
HEX-M BRAND



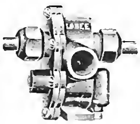
EVANS MANUFACTURING CO.
Fishing Swivels, Rings—Spoons.

The East Hampton Bell Co.
Bells and Gongs



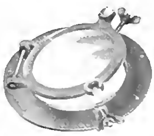
Geo. Kirby Jr. Paint Co.
Marine Paints.
Old Style Copper Paint.

Philadelphia Hardware & Malleable Iron Works
Marine Malleables & Drop Forgings



THE LEETONIA TOOL CO.
Marine, Railroad and Mining Tools.

Portable Light Co.
Search Lights and Sirens

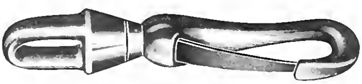


Torrey Roller Bushing Works
Sheaves, Bushings, Marine Hardware

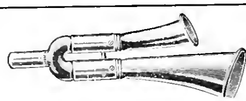
The SEA-DOG Line of Fishing Supplies, Etc.

Cast Brass Swivels, Snaps and Rings
Self-Lubricating Trolling Blocks
Brass Brailing Blocks
Brass Line Clamps
Steel Wire Cutting Pliers
Fish Gaffs and Spears
Rubber Trolling Tubing
Flax Leader Line

Signal Horns and Whistles
Double Acting Wing Pumps
Ship's Clocks, Barometers, Binoculars
Flags, Hooks, Lights, Preservers

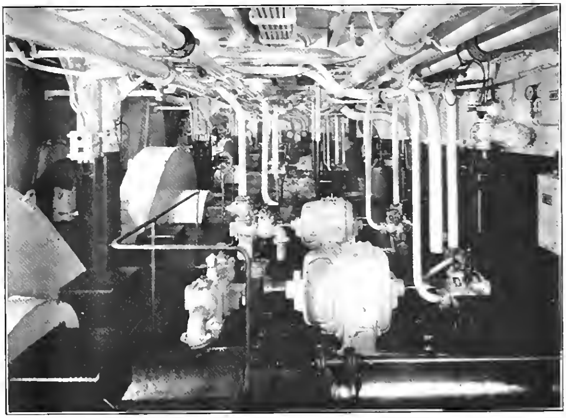


FACTORS S. F. MARINE SUPPLIES



laryngophone is installed for direct communication to the engine room, and the bridge has connection through the ship's telephone system with every part of the vessel.

The Asama Maru power plant is that of a more powerful Aorangi, with considerable improvement in control and in operating efficiency. She will make an even better demonstration of the economy of the Sulzer diesel marine power plant than that made by the Vancouver-Sydney "Cloud Piercer."



View across the after end of the lower platform in the engine room of the Asama Maru featuring the Sulzer thrust bearings and the Sulzer lubricating oil pumps.

Pacific Boatyard Notes

(Continued from Page 515)

Angeles by W. C. Billsborough, J. H. Mundhenk, and H. F. Smothers.

This firm will take over the steel welded boat building business of the Los Angeles Manufacturing Company which recently completed an all-steel electrically welded yacht for Wm. Creakbaum and Ray Chaplin of Los Angeles. The yacht is 56 feet long, 13.6 feet beam, and 4.5 feet draft. She is powered with a Cummins, Type K, 6-cylinder, 4-cycle, full diesel engine of 170 horsepower, fitted with electric starter and arranged for full pilot house control. Accommodations are provided for 15 persons, including the crew.

The manner of welding this hull was described in the August issue of Pacific Marine Review, page 331.

San Pedro Boat Building Company, San Pedro, Calif., has recently completed a 100-foot diesel powered bait boat, the Cipango, designed by A. D. Lee and the builders for Y. Nagasugi and N. Maieda, who fish for the California Packing Corporation out of San Pedro. The vessel is equipped with space for 140 tons of iced fish, and cost around $70,000. She has a 375 shaft horsepower, 6-cylinder, **Western-Enterprise** diesel, **Lipman** refrigerator, and **Byron-Jackson** pumps.

This yard is also building a bait boat 102 feet long, 25 feet beam, and 12 feet depth for Andrew Zambarlin. The boat will have a main power plant of 375-horsepower and will have capacity for 140 tons of iced fish. Delivery is scheduled for next February.

H-10 Water Taxi Company, of San Pedro, is to have a new 50-foot water taxi powered with a diesel engine as an experiment with this type of power plant in its fleet. A **Winton** Model 6, 150-horsepower diesel is being installed in a new vessel under construction at the company's plant on Watchorn Basin in Los Angeles Harbor. Arthur Pankey is the designer.

Al Larson, boat builder at Los Angeles Harbor, is building a 115-foot refrigerated bait boat for Ido, Ishi, and Shindo, San Pedro fishermen working for the Van Camp Sea Food Company. The boat will have a beam of 27 feet and depth of 12 feet. She will have cork insulation and electrical refrigeration. The main power will be supplied by a 450-horsepower diesel engine. The iced fish capacity will be 190 tons, and the boat will have a cruising radius of 5000 miles.

This yard recently completed a 76-foot purse seiner for Bernard Carr and Ray Katenich.

Fahy & McNulty, freight forwarders, Pier 5, San Francisco, have been granted permission by the State Railroad Commission to operate a speed-boat passenger service between the Oakland municipal airport and the Ferry Building, San Francisco.

Anderson & Cristofani, San Francisco, are building a self-propelled wooden barge for the Fay Transportation Company of Rio Vista, California. The barge is to be 140 feet long, 38 feet beam, and is to be powered with two 135-horsepower **Atlas** diesel engines.

This plant is also building a 60-foot fishing boat to be powered with a 90-horsepower Atlas diesel engine for a Monterey fisherman.

Work will be started in December on a new 45-foot trap tender at the yards of the **J. M. Martinac Shipbuilding Company,** Tacoma, for the account of Frank Berry of Tacoma, owner of the vessel Nome. The little ship will be of heavy wood construction and with 11 feet 8½ inches beam and 4 feet draft, and will be powered with a 40-h.p. **Atlas** full diesel.

This yard also has under contract at the present time six large repair jobs and will build a large marine railway this winter to accommodate ships up to 120 feet in length.

Contracts have been let to the **Johnson Shipbuilding Co.,**Seattle,by **L. E. Geary,** architect, for the construction of two more vessels for the fishing trade. The largest is a 75 by 18 by 8-ft. cannery tender for the San Juan Fishing and Packing Company of Seattle, and will be powered with a 4-cylinder 135-horsepower diesel, make not specified. The second will be a 50-foot fish carrier powered with a 50-horsepower diesel for P. E. Harris.

San Francisco Bay Shipping Directory

Simpson & Fisher
INCORPORATED

Sailmakers and Dealers in Cotton Duck

For Domestic and Export Trade

Selling Agents
Protectol Liquid Waterproofing

R. P. RASMUSSEN
MANAGER

240 Steuart Street
SAN FRANCISCO

ETS-HOKIN and GALVAN

MARINE ELECTRICIANS
RADIO ENGINEERS

Supplies, Repairs, Construction

181 STEUART STREET, SAN FRANCISCO
Phone: Davenport 1526

240 CANAL AVE., WILMINGTON, CAL.
Phone Wilmington 704

HAVISIDE COMPANY

SEAGOING STEEL WRECKING AND SALVAGE BARGES

Complete Salvage Equipment
Lifting Capacity up to 100 tons

SUBMARINE DIVING
SHIP CHANDLERS
SAIL MAKERS SHIP RIGGERS

Agents:
American Steel & Wire Co.
Stratford's Best Oakum
Fitler's Cordage
Alberton Cotton Duck

56 Steuart St. Tel. Davenport 3643
San Francisco

A. J. MORSE & SON, Inc.

DIVING APPARATUS
FIRE SUPPLIES AND THE INVINCIBLE NOZZLE

221 HIGH ST. Boston, Mass.

The C. J. Hendry Company
San Francisco,
San Pedro San Diego.

G. BRUCE NEWBY

NAVAL ARCHITECT · MARINE SURVEYOR

LOS ANGELES HARBOR
524 WEST SIXTH STREET
SAN PEDRO, CALIFORNIA
TELEPHONE 4517

PAGE BROTHERS

SHIP AND FREIGHT BROKERS

310 California Street, San Francisco

907 Dexter Horton Bldg.
Seattle, Wash.

1114 Board of Trade Bldg.,
Portland, Oregon

Tel. Kearny 2907

D. W. DICKIE

ENGINEERS and NAVAL ARCHITECTS

SANTA MARINA BUILDING
112 MARKET STREET

SAN FRANCISCO
CALIFORNIA

Telegraphic Address, "DICKIE," San Francisco

C. J. HENDRY CO.

27-31 MAIN STREET
Davenport 2800
San Francisco, Cal.

435 FRONT STREET
San Pedro, Cal.

SHIP CHANDLERY—Columbian Manila Rope, Engineers' Supplies, Woolsley's Copper Paint

FISHERIES' SUPPLIES—Linen Salmon Netting and Threads, Cotton Netting, Rope and Seine Twine, Fishing Boat Supplies

C. H. EVANS & CO.
Established 1875

MACHINE WORKS

Repairing—Pipe Cutting—Pumps
Evans' Steam Steering Gear

187 FREMONT STREET SAN FRANCISCO

J. & R. WILSON, Inc.

SHIP CHANDLERY and SHIP PROVISIONS

Lion Patent Asbestos and Semi-Metallic Packing

127-135 STEUART ST. SAN FRANCISCO

WELCH & COMPANY

SHIPPING AND COMMISSION MERCHANTS

MATSON BLDG., 215 MARKET ST., SAN FRANCISCO
Telephone Kearny 624-625

VEHISOTE
Trade Mark.

THE STANDARD PANEL BOARD

recognized by

ALL SHIPYARDS, NAVAL ARCHITECTS AND SHIP OWNERS

Samples and information gladly furnished on request.

PANTASOTE COMPANY, INC.

250 Park Avenue at 46th Street, New York
People's Gas Building, Chicago.
753 Monadnock Building, San Francisco, Calif.

WATERHOUSE-LESTER-SCOVEL CO.
540 Howard Street, San Francisco, Calif.

The Estate of

W. W. SWADLEY, *Photographer*

wishes to announce that the business formerly conducted by Mr. Swadley at 268 Market Street is being carried on in conjunction with the business of

MORTON & CO., Commercial Photographers, 515 Market Street

All negatives made in the past by Mr. Swadley have been transferred to 515 Market Street and will be available under the same file numbers as previously and all correspondence regarding reprints or making new photographs should be addressed to 515 Market Street.

The telephone number remains the same: SUtter 2310

The estate also wishes to express appreciation to Mr. Swadley's friends and customers for their patronage and assure a continuation of high class service under the new arrangement.

Estate of W. W. SWADLEY.
Mrs. Marion Swadley.
Mrs. Marietta Knowlton, Executrix.